

Rock Products and BUILDING MATERIALS

INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVII.

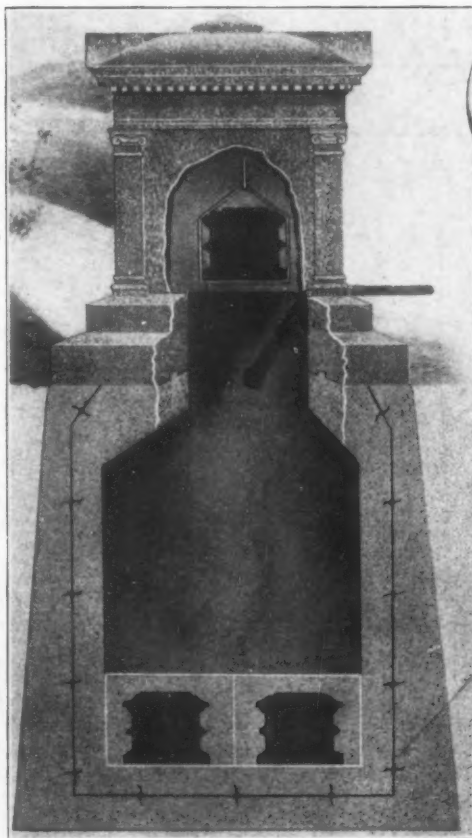
CHICAGO, ILL., APRIL 22, 1916.

Number 12

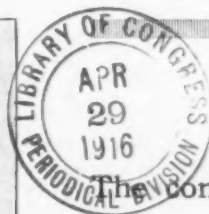
Concrete for Burial Purposes

(SEE ARTICLE ON PAGE 28)

Heretofore we have had much to say about the appeal of concrete and its blessings to living humans. We now introduce the really acceptable application to the burial of the dead.



Transverse Section, Showing Structural Details and Method of Lowering Body. Arrow Indicates Copper Lining.



The combination of a correctly designed and permanent underground sepulcher with a dignified visible memorial supplies a long needed and well recognized improvement.

Available Right Now in Every American Cemetery Through the Established Channels of the Monument Trade

Giant BELT for Your Drives
Granite BELT for Your Elevators
Supremo BELT for Your Conveyors

WHY? ASK US.

Revere Rubber Co.

BOSTON NEW YORK CHICAGO NEW ORLEANS PHILADELPHIA

Clinchfield Portland Cement Corporation

General Office and Mills:
 Kingsport, Tenn.

*Strong
 &
 Sound*



*Fine
 &
 Uniform*

"The Acknowledged New Standard of the South"

**Annual Capacity
 1,500,000 Barrels**

Sales Offices:
 KINGSFORT, TENN.

1305 Union Trust Bldg. 908 Com'l Bank Bldg. 413-15 Am. B'k & Tr. Bldg.
 CINCINNATI, OHIO CHARLOTTE, N. C. SAVANNAH, GA.



Patented

"PENNSYLVANIA"

Hammer Crushers For Crushing and Pulverizing Lime
 Limestone, Gypsum, Marl, Shale, Etc.
 Main Frame of Steel, "Ball and Socket" Self-aligning Bearings;
 forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand
 wheel while Crusher is running.
 No other hammer Crusher has such a big Safety Factor.

Pennsylvania Crusher Co.

New York PHILADELPHIA Pittsburgh

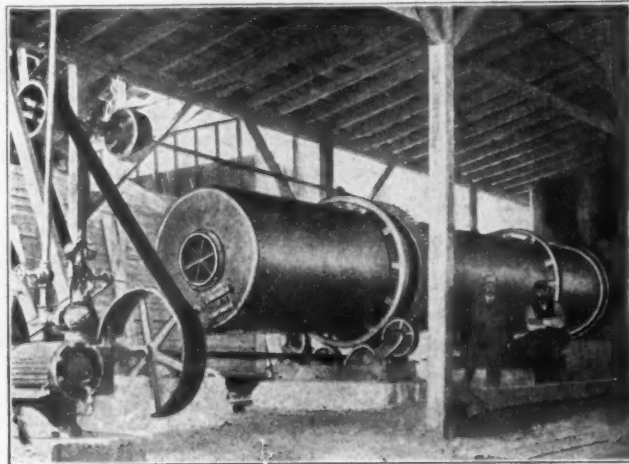
CONSISTENT ADVERTISING

UNLIKE THE PROVERBIAL ROLLING STONE
 GATHERS MOSS

RUGGLES-COLES DRYERS

STATIONARY AND PORTABLE

"Built to Dry at the Lowest Ultimate Cost"



Seven different types of dryers in many sizes and
 special dryers designed and built to meet unusual con-
 ditions. We are now drying 67 kinds of materials,
 among them sand, rock, gravel, gypsum, coal, clay, etc.

Our many years of experience is at your service

Ruggles-Coles Engineering Co.

CHICAGO OFFICE,
 McCormick Bldg.

50 Church Street
 NEW YORK

Daily Capacity
 9000 Barrels



Quality
 Quantity
 Service

MORE THAN FIFTEEN YEARS OF SATISFACTION

FOUR PLANTS:
 ALPENA, DETROIT, WYANDOTTE and CLEVELAND

HURON and WYANDOTTE

Great Water and Rail Facilities
 Best Serve the Entire Middle West

EVERY BARREL TESTED AND GUARANTEED
 SOLD BY THE BEST DEALERS USED BY THE BEST BUILDERS

Main Offices: 1525 Ford Building, Detroit, Mich.

Daily Capacity
 9000 Barrels



Quality
 Quantity
 Service

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

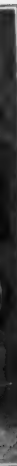
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7

Get the TOCH AGENCY Proposition

—and Cash in on Toch Advertising



"We've got to save our concrete floors"

"Our cement floors are comparatively new and they are the best floors we could lay down, but the surface is already sanding; water is getting spilled on them and they are soaking up oil. I tell you, gentlemen, we have got to save them."

R.I.W. CEMENT FILLER & CEMENT FLOOR PAINT
Pat. 25 to Portland Cement 2-27-06.

will keep cement floors wearproof, waterproof and oilproof. Scuffed off dust won't float in the air to ruin merchandise, get into bearings and cause electric motors to spark. Water won't get in to rust the reinforcement. Oil won't get in, never to be gotten rid of, to soften the concrete. R. I. W. Cement Filler and Cement Floor Paint fills up the sandy, porous surface and prevents all wear on the floor itself. Twelve standard shades.

Let us mail you a special booklet. Address Dept. Q.

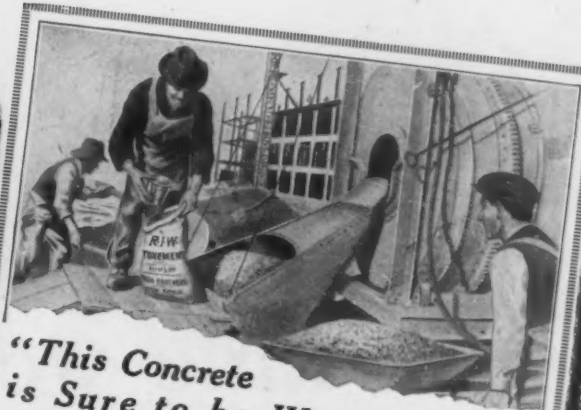
TOCH BROTHERS
Established 1848

Inventors and Mfrs. of R. I. W. Preservative Paints, Compounds, Enamels, etc.

320 Fifth Avenue, New York

Works: New York, London, Eng., and Toronto, Can.

Examples of the Ads Running in 30 Magazines



"This Concrete is Sure to be Waterproof!"

I JUST measure out two pounds of this dry powder to each bag of Portland Cement and it makes concrete that is watertight.

R.I.W. TOXEMENT
Pat. 25 to Portland Cement 2-27-06.

is an integral waterproofing compound for concrete, stucco, Portland cement mortar, etc. It comes in bags like cement and is added in small quantities at the mixer.

Does not hasten or retard the setting, but lubricates and insures concrete that is watertight. Used in the Woolworth Building, The Yale Bowl, Cooper Institute Annex, Lehigh Valley Grain Elevator, Dry Dock Brooklyn Navy Yard, etc. Write Dept. Q for the "Toxement" Booklet.

TOCH BROTHERS
Established 1848

Inventors and Mfrs. of R. I. W. Preservative Paints, Compounds, Enamels, etc.
320 Fifth Avenue, New York
Works: New York, London, England and Toronto, Canada.

Toch Products Sell Easily

We have open at the present time some of the most desirable territory in the United States and would be pleased to hear from individuals or firms already established in the building material business with a view to adding to our list of agencies.

The house of Toch Brothers is a world-wide institution. Its great family of damp-proofing and waterproofing materials for concrete, stone, brick, plaster, steel, wood, etc., is recognized as standard throughout the world and is being used in the greatest building operations everywhere. Many prominent architects specify Toch Products exclusively.

A big list of national and trade magazines is carrying Toch advertising—some thirty different publications in all—most of them weeklies. The Toch field has been cultivated in this big way for years. The missionary work is being done at our expense. Why not stock our line and cash in on it?

Only well-established, reputable houses considered. If you are "live wires" in your territory, sign the coupon below and mail to us immediately.

The building season is starting. This is the time to act. Don't delay.

TOCH BROTHERS

ESTABLISHED 1848

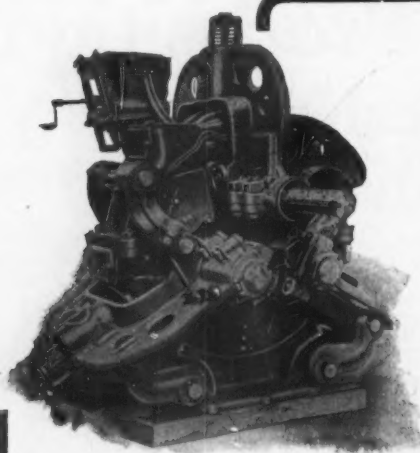
Inventors and Mfrs. of R. I. W. Preservative Paints, Compounds, Enamels, Etc.

320 FIFTH AVENUE, NEW YORK CITY

Works: New York, London, England, Toronto, Canada.

TOCH BROTHERS, 320 Fifth Avenue, New York City.
Gentlemen: I am interested in learning about the Toch Agency Proposition you are making to live agents.
Name
Address

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



MAXECON

Means MAXimum of ECONomy

Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY, Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

WE DO NOT CLAIM ALL of the CREDIT for this achievement

We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cement Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co., Western P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

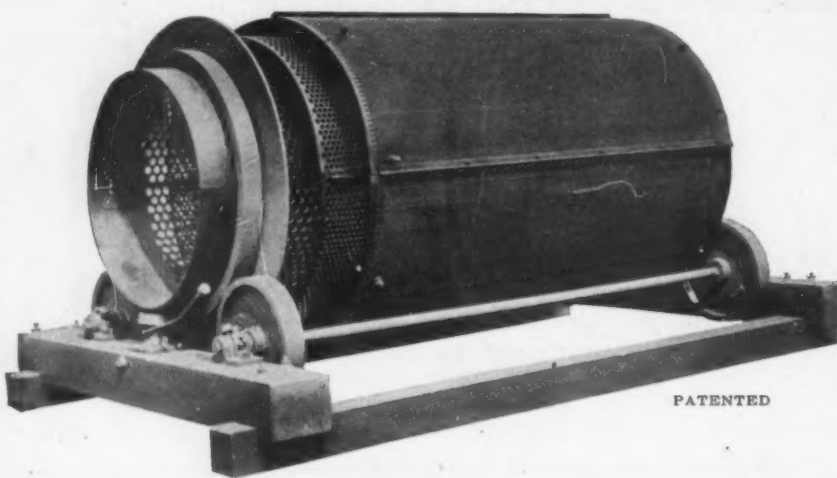
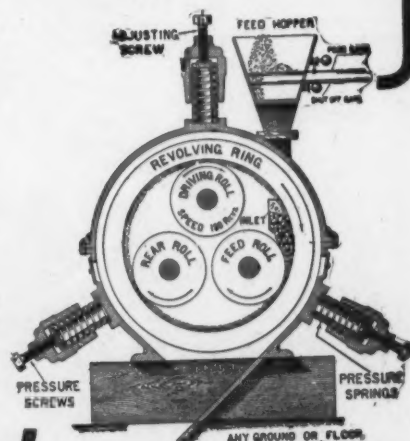
THE RING WOBBLES

The FREE WOBBLING POUNDING RING instantly and Automatically ADAPTS its position to the variations of work.

Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.

KENT MILL CO.

10 HAPLEYA ST., BOROUGH OF BROOKLYN, N. Y. CITY
LONDON, W. C., 31 HIGH HOLBORN
BERLIN-HOHENSCHOENHAUSEN



PATENTED

Johnston & Chapman Co.
2921 Carroll Avenue, CHICAGO

For Dry Screening Gravel
we make the most up-to-date machine on the market. Simple and Inexpensive.

A New Jacketed Type of Cone Screen for Washing Gravel. A Perfect Screen.

Complete Gravel Washers of Any Size. Successfully used in several of the largest gravel plants in the United States.

Another of Our Products that Can't be Beat

The O'Laughlin Screen

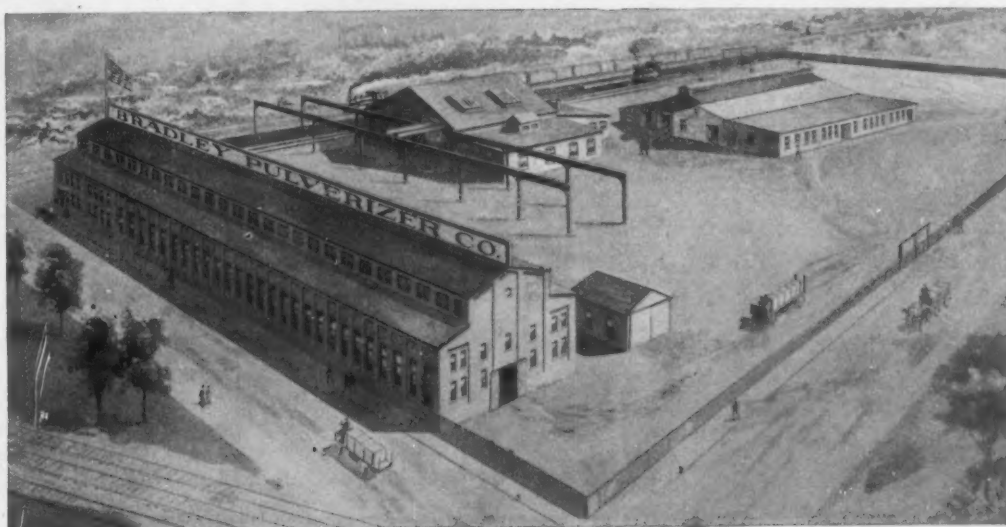
for Crushed Stone
See Illustration

SCREEN SECTIONS for ALL SIZES of REVOLVING SCREENS

CONICAL SCREEN SHELLS
FOR GRAVEL WASHING PLANTS

Everything in Screens Made Right, for
Crushed Stone, Gravel, Sand, Clay, Ore, Etc.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



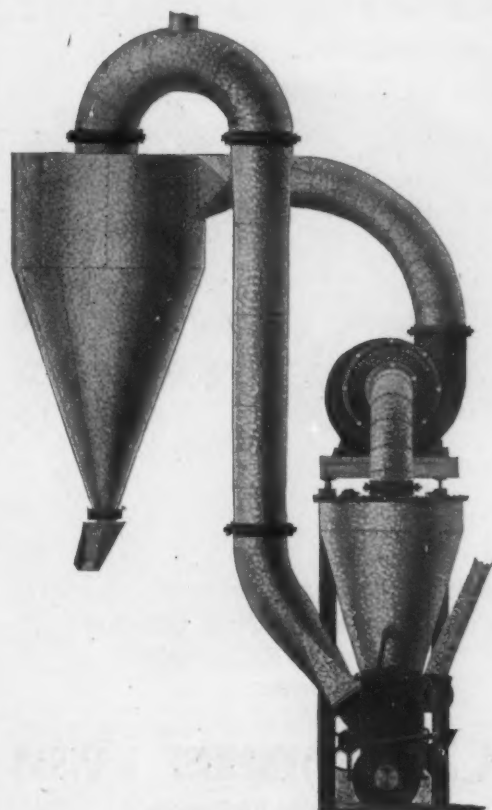
THE NEW WORKS OF AN OLD COMPANY

OUR INCREASING BUSINESS HAS DEMANDED LARGER QUARTERS FOR THE MANUFACTURING OF THE GIANT GRIFFIN, BRADLEY THREE ROLL AND BRADLEY HERCULES MILLS. OUR NEW WORKS AT ALLENTOWN, PA., ARE IN FULL OPERATION AND OPEN FOR INSPECTION

BRADLEY PULVERIZER CO.

BOSTON, MASS.

WORKS: ALLENTOWN, PA.



There's a Difference Between Pulverizing Materials
by the

RAYMOND PULVERIZING AIR-SEPARATING SYSTEM

and other methods. More than 400 concerns grinding 100 different materials have found to their entire satisfaction and profit that the Raymond System produces larger economies than any other known method.

The savings produced in these plants by the Raymond System have been enormous both in the low cost of operation and the fact that it produces a finer, more uniform product than any other method.

In the first place, we use no expensive screens or bolting cloths but **air-separate** the material to obtain the required fineness.

In the second place, we eliminate the necessity of using expensive elevating and conveying machinery by using the same air (without additional power) to deliver the finished product direct to the next point of operation or storage.

And finally the whole operation is entirely enclosed and **Absolutely Dustless.**

Wouldn't you be interested to know just what the Raymond System could do for you in your plant?

The coupon
will bring
you our
catalog

RAYMOND BROS. IMPACT PULVERIZER COMPANY

1301 North Branch Street, CHICAGO, ILL.

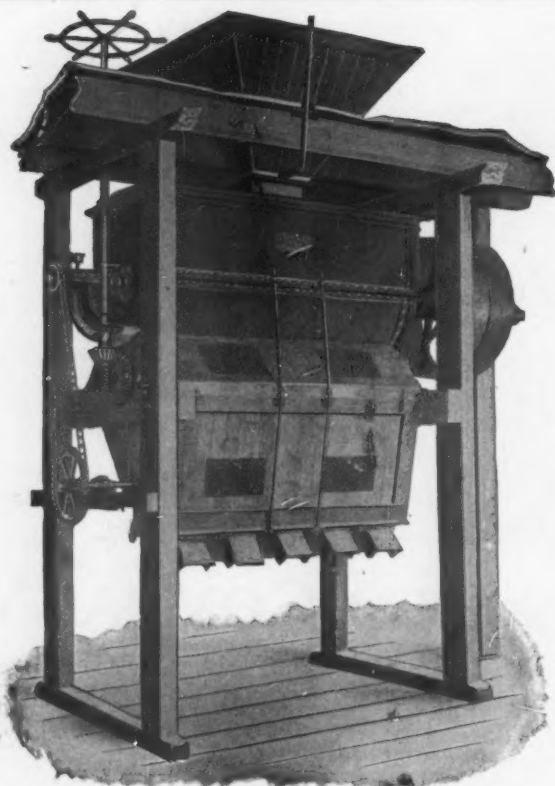
Please send us your literature.

NAME

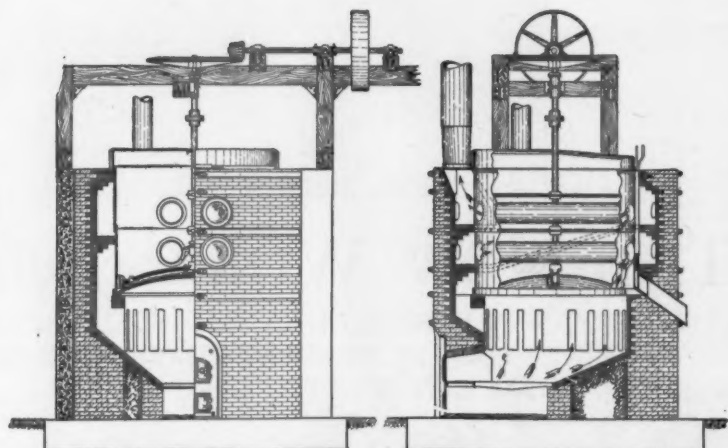
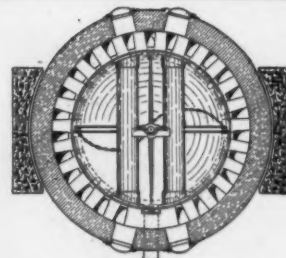
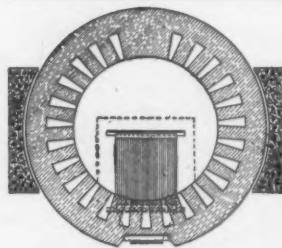
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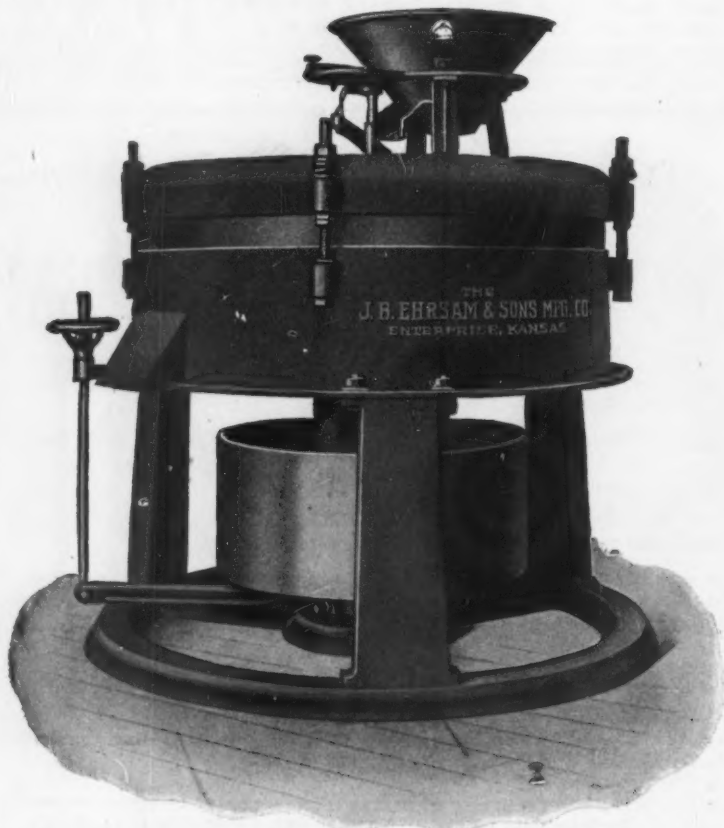
Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



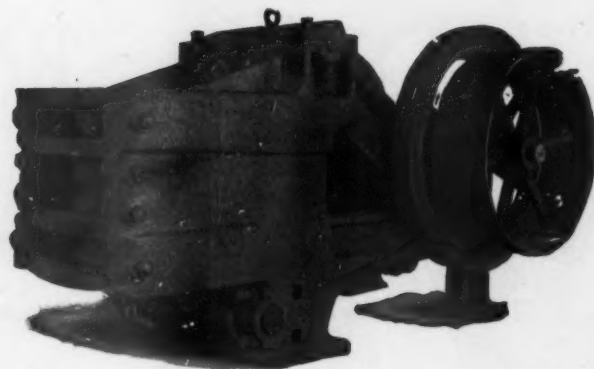
Enterprise Noiseless Mixer



Ehram Calcining Kettles—Built in 5 sizes—6-8-10-12-14 feet in diameter, having capacity of from 3 tons to 20 tons to the charge



Horizontal and Vertical Heavy Duty Grinding Mills

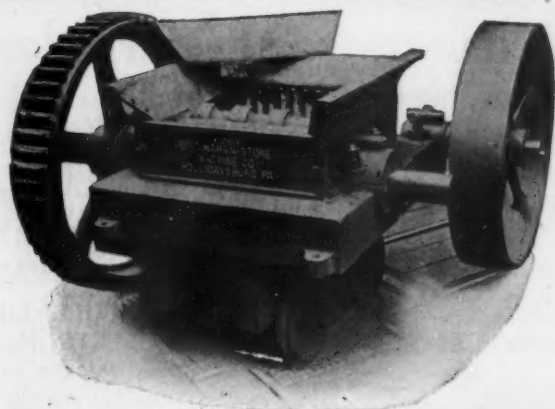


Jaw Crushers Built in all sizes up to 24" x 34" jaw opening. Rotary Fine Crushers in sizes up to 42" inside diameter.

The J. B. Ehram & Sons Mfg. Co., ENTERPRISE, KANSAS

Manufacturers of Plaster Mill Machinery, Conveying, Elevating and Power Transmission Appliances

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



OUR SINGLE ROLL CRUSHER IS AS SIMPLE AS CAN BE

Is easily fed, makes less fines than either a Gyratory or Jaw. Capacity 5 to 500 tons per hour. For crushing Limestone, Dolomite, Hard Rock Phosphate, Cinders, Etc. Screens of all descriptions. Washers for dirty stone.

Ask for Information

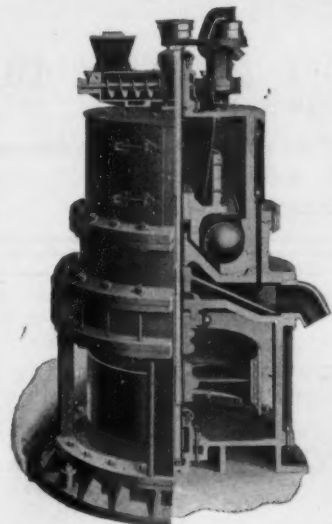
McLANAHAN-STONE MACHINE CO., Hollidaysburg, Pa.

**BACON \ FARREL
ORE & ROCK
CRUSHING \ WORLD KNOWN
ROLLS-CRUSHERS**
EARLE C. BACON, ENGINEER
HAVEMEYER BUILDING, NEW YORK

The Fuller-Lehigh Pulverizer Mill

A Complete Self-Contained Unit

**The most economical mill for producing
Agricultural Limestone**



Built in sizes to meet the requirements of your trade. Grinds rock to meet the specifications of all Agricultural Experiment Stations.

SEND FOR CATALOG NO. 70

Lehigh Car, Wheel & Axle Works
Main Office and Works: Catasauqua, Penna.

Reduces lump rock to 20, 40, 60, 80, 100, or 200 mesh.
Requires no outside accessory equipment.
Requires no overhead shafts, drives or screens.
All material discharged from mill is finished product.
No inside journals or bearings.
No inside lubrication.
Uniform feeding system.
Constant and free discharge.
Low installation cost.
Low operating cost.
Low lubricating cost.
Dustless operation.

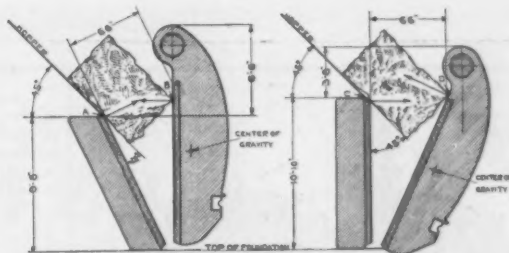
The Success of A. C. Steel Frame 84" x 66" Jaw Crusher

Is Due to Its Improved Design

Embodying the

Vertical Swing Jaw

As Illustrated by a Comparison of Receiving
Openings, Inclined Versus Vertical Swing Jaw



Sketch No. 1:
Allis-Chalmers Vertical Swing Jaw

Sketch No. 2:
Old Inclined Swing Jaw

Improvements in Feeding

Sketch No. 1 shows a block of stone 4'-6" x 6'-6", as it would naturally be delivered to the crusher. Note that the stone strikes the moving jaw at a point considerably below the fulcrum point and within the crushing zone. A stone in this position will be crushed, or positively forced into the crusher as the reaction from the surfaces at points A and B intersect each other, thereby preventing any tendency to lift the stone out of the crusher.

Referring to Sketch No. 2, where a block of stone of the same size is shown, note that the stone strikes the moving jaw near the fulcrum point, where there is little motion, entirely outside of the crushing zone, and above the jaw plates. A stone in this position will not be crushed, as the reaction from the surfaces at points C and D do not intersect, and the tendency of these forces is to lift the stone out of the crusher.

In Sketch No. 1 the stone has to turn only 20 degrees to rest flat against the stationary jaw, while in Sketch No. 2 the stone must turn 45 degrees to take the same position.

Note the difference in height of the two types of crusher, measuring from top of foundation to top of stationary jaw plate. Also note that with construction shown in Sketch No. 1 there is much less chance for material to jump over top of the moving jaw.

Improvements in Operating

When taking up wear of jaw plate or inserting new plates, both back and front toggles as well as the shims behind toggle block are readily freed on account of the tendency of the vertical swing jaw (Sketch No. 1) and of the pitman to swing forward because their center of gravity is located behind their respective point of support.

This is an important operating feature considering the great weight of the affected parts.

SMALLER JAW CRUSHERS DOWN TO LABORATORY SIZE

**Complete Rock Crushing Plants
and Cement Mills — Power Plants —
Electric Motors — Gates Gyratory Breakers**

**Allis-Chalmers
Manufacturing Company**

OFFICES IN ALL PRINCIPAL CITIES

MILWAUKEE,

WISCONSIN

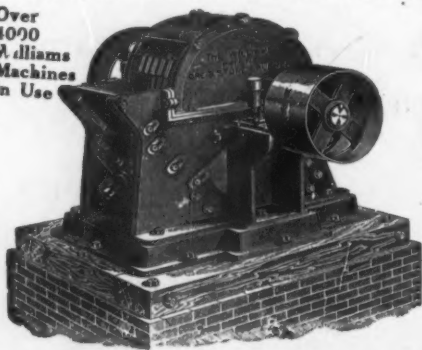
For All Canadian Business

Refer to Canadian Allis-Chalmers, Ltd., Toronto, Ont.

FOREIGN REPRESENTATIVES—Chile and Bolivia: Mark E. Lamb, Huerfano 1157, Casilla 2653, Santiago, Chile. Europe, East Indies, etc.: H. L. Keen, 782 Salisbury House, London Wall, London, England. South Africa: Herbert Ainsworth, P. O. Box 6659, Johannesburg. Australia: Frank R. Perrot, 883 Hay St., Perth, W. A., and 204 Clarence St., Sydney, N. S. W. South America, China, Philippine Islands, Japan: American Trading Co.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Over
4000
Williams
Machines
in Use



Lump Lime Crushers and Grinders

We specialize in extra heavy crushers for lump lime—for hydrating or for agricultural work

SPECIFICATIONS

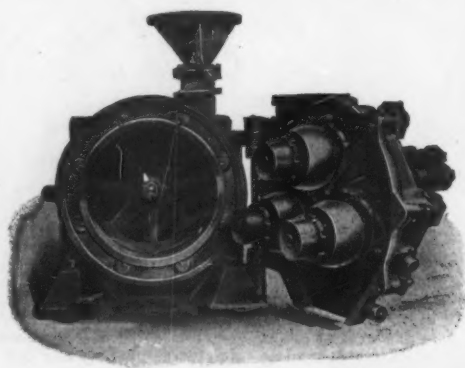
SIZE	WEIGHT	CAPACITY TONS HOUR TO 1/4"	CAPACITY TONS HOUR 6 MESH.	H. P.
No. 1	7000 lbs.	8-10	6-8	20-25
No. 2	8500 lbs.	10-15	8-10	30-35
No. 3	12000 lbs.	15-18	12-15	40-50

A FEW USERS
Kelly Island and Lime Co.
National Lime & Stone Co.
U. S. Gypsum Co.
Tidewater Pt. Cement Co.

ALSO MADE IN SIX LARGER SIZES — WE ALSO MAKE A FULL LINE OF LIMESTONE CRUSHERS AND GRINDERS. WRITE FOR BULLETIN No. 4

The Williams Patent Crusher & Pulverizer Co.

General Sales Dept., Old Colony Bldg., CHICAGO, ILL.
2705 N. Broadway, ST. LOUIS, MO.
268 Market St., SAN FRANCISCO, CAL.



STURTEVANT MACHINERY

CRUSHERS

GRINDERS

SCREENS

Thirty Years of Practical Experience has taught us that no one machine is adapted to all purposes. Customers expect correctly designed machines for their special work. Our large line enables one to select properly. It consists of:

CRUSHERS—For coarse, medium and fine work on hard or soft rock. Jaw, Rotary and Hammer design.

CRUSHING ROLLS—Coarse, medium and fine. Hard or soft rock,—wet or dry.

RING-ROLL MILLS—For pulverizing hard materials.

EMERY MILLS and HAMMER-BAR MILLS—For pulverizing softer materials.

SCREENS—Inclined Vibrating and Rotary for fine or coarse work—wet or dry.

Sampling Crushers, Rolls, Grinders and Screens.

Send for Catalogue.

STURTEVANT MILL CO., Boston, Mass.

NEW YORK

CHICAGO

DENVER

PITTSBURGH

LONDON, ENG.



The Ring as used in the American Ring Pulverizer

is made of Man-
ganese Steel.
Weight, 27 lbs.,
has 64 sq. inches
of crushing sur-
face on its tread,
no square cor-
ners to wear off
—crushes by

impact, grinds by attrition and compression in combination, its adjustment controlled by centrifugal force, its striking force equals 1 ton, its centrifugal force equals 1 3/4 tons, applied 10 times per second at any given point, reduces speed of the Pulverizer to 600 R. P. M.

Presents an unequalled Crushing and Grinding factor

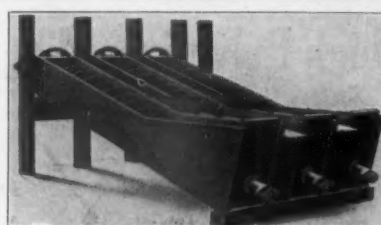
The American Ring Pulverizer

is superior—Saves power and
upkeep, grinds faster and finer.

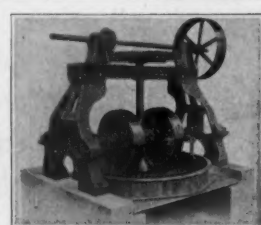
Send for Catalog No. 21

AMERICAN PULVERIZER COMPANY

East St. Louis, Illinois



Sand Washers

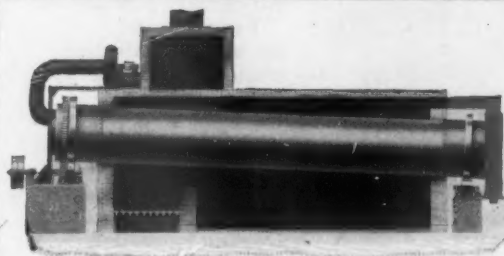


9-Foot Dry Pan

LEWISTOWN FOUNDRY & MACHINE CO.
LEWISTOWN, PA.

Builders of heavy duty crushers and glass sand machinery
Glass sand plants equipped complete

WRITE FOR PRICES AND CATALOG



We make the
largest variety
of
**MECHANICAL
DRYERS**

Write for
Catalog
No. 16

We are also Engineers and Manufacturers of
Car Hauls
Crushers and Pulverizers
Drop Forged Chain
Elevators and Conveyors
Soft Mud Brick Machinery
Feeders
Mining Machinery
Mixing Machinery
Sand Plants
Screens

THE C. O. BARTLETT & SNOW CO., Cleveland, Ohio

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



AUSTIN GYRATORY CRUSHERS

Made in Eight Sizes

50 to 5000 Tons Per Day

Plans and Specifications submitted and expert advice free on any problems involving rock-crushing or earth-handling.

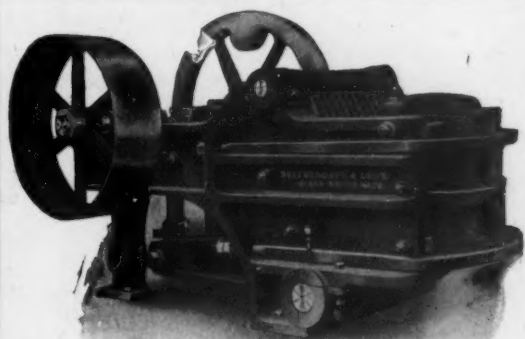
AUSTIN MANUFACTURING CO.

New York Office: 50 CHURCH STREET

CHICAGO

Canadian Agents: MUSSENS, Ltd., Montreal

We manufacture:—Road and Elevating Graders, Scarifiers, Road Rollers, Quarry Cars, Dump Wagons, Stone Spreaders, Street Cleaning Machinery.



Jaw and Rotary CRUSHERS

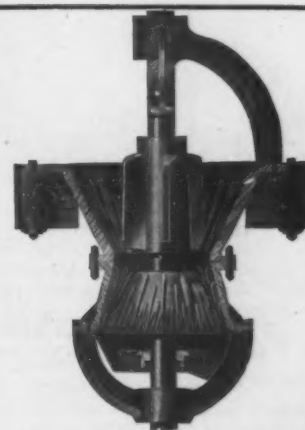
For all Rocks and Ores Softer than Granite

GYP SUM MACHINERY—We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe
17 Huron Street, Grand Rapids, Mich.

Nippers—17 x 19", 18 x 26", 20 x 30", 24 x 36" and 26 x 42"



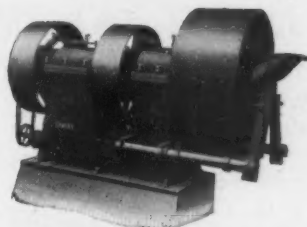
Crackers—6 sizes—many variations.

Record of 48-Inch Crusher for a Period of Approximately 11 Months—

	Per Ton Crushed
Operating labor.....	\$0.00214
Repair labor.....	.00205
Material for repairs.....	.00280
Power.....	.00899
Total.....	\$0.01598
Less extraordinary items.....	.00228
Cost under normal conditions.....	\$0.01370

No. 1 Crusher ran 4,392 hours and crushed 197,640 tons of ore. One pair of discs ran 3,453 hours, crushing 155,385 tons at cost of \$0.0014 per ton for discs.
No. 2 Crusher ran 4,462.5 hours, and crushed 200,812.5 tons ore. One pair discs ran 4,462.5 hours, crushing 200,812.5 tons at cost of \$0.00109 per ton for discs.
Crushers handled 45 tons per hour, crushing 3 in. to ¾ in. and requiring 35 horsepower each.

Eventually Symons Discs

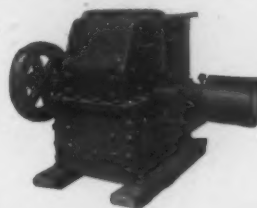


MANUFACTURED AND SOLD ONLY BY
CHALMERS & WILLIAMS

New York Office, Equitable Building
1450 Arnold Street, Chicago Heights, Illinois

The Strength to Endure

This is the quality you get when you buy a



K-B Pulverizer

It is built entirely of steel and is lined throughout with manganese hardened steel plates. The service of the hammers is multiplied by four by a simple device, which makes them adjustable to compensate for wear.

This pulverizer has been designed to fill the need for a strong, practical, and efficient hammer-mill. Using only 10-15 H.P. the No. 1 will reduce 4-7 tons of stone, or 8-12 tons of lime per hour. The No. 2 has a proportionately high capacity and low power consumption.

The interior of the machine is readily accessible, for our screen slides out of the lower casing like a drawer.

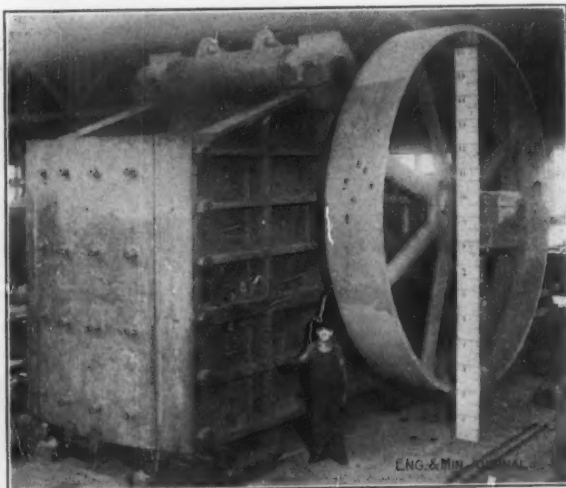
Write today for catalogue

K-B PULVERIZER CO., Inc. 86 Worth Street
New York City
BUILT for SERVICE and DURABILITY

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

THIS IS THE
Traylor 60"x86" Jaw Crusher

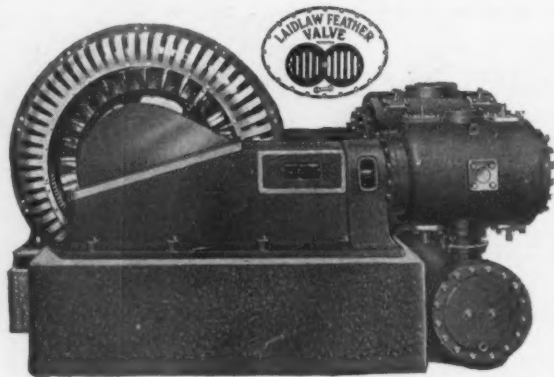
THAT IS READY NOW FOR DELIVERY
TO YOU



THE OWNERS OF THIS MAMMOTH CRUSHER HAVING NO USE FOR IT UNTIL THE EUROPEAN WAR IS OVER HAVE AT LAST ALLOWED US TO OFFER IT TO USERS OF CRUSHING EQUIPMENT AT A PRICE THAT IS ATTRACTIVE

TRAYLOR ENGINEERING & MFG. CO.

NEW YORK OFFICE 24 Church St. MAIN OFFICE & WORKS Allentown, Pa., U. S. A. WESTERN OFFICE Salt Lake City, Utah.



LAIDLAW
Feather Valve
COMPRESSORS

include features which greatly increase the return heretofore possible for money invested. These machines have established notable records for low operating costs.

Described in detail in Bulletin L-530-58.

Write for a copy

International Steam Pump Co.
Laidlaw-Dunn-Gordon Plant

115 Broadway, New York Works: Cincinnati, O.
Branch Offices in All Principal Cities

L.281.2

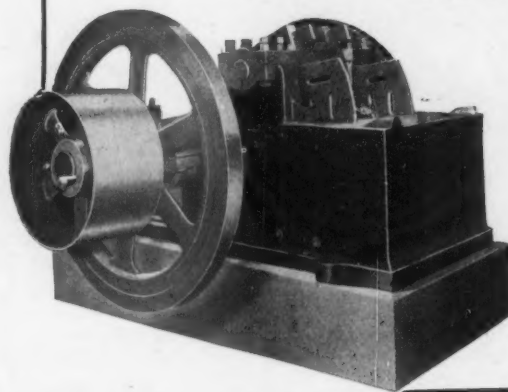
Cement Production Cost

is materially lowered by the installation of Blake Type Crushers.

The crusher which we manufacture has fewer parts and is kept more easily in repair than any other style on the market.

Webb City and Carterville Foundry and Machine Works

Main Office Webb City, Mo.



No Idle
Teams Here



**Loading Two Wagons at One Time
With a JEFFREY 1916 Model Self-Propelling Wagon and Truck Loader**

The Jeffery Loader pictured above is a Type A-15 driven by a gasoline engine, and is working in a gravel pit in Canton, Ohio.

By means of a special Two-Way Chute, two wagons may be loaded at one time. Different size products may be obtained by changing the removable screen.

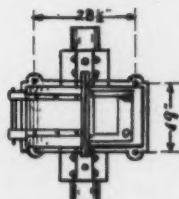
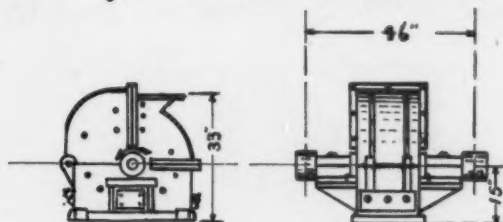
This machine is proving very satisfactory, the savings it has effected in loading and screening their Sand and Gravel will soon pay for it.

Bulletin No. 165-35 has many splendid testimonials and full details of our Standard Loaders to suit various conditions and materials

The Jeffrey Mfg. Company 935 NORTH
FOURTH STREET Columbus, Ohio
New York Philadelphia Chicago Milwaukee Boston
Pittsburgh Birmingham Denver Montreal

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

For Any Crusher Plant Design



Pulverizer No. 1

Pulleys—8" x 6".
R. P. M.—1000 to 1500
Size feed—4" x 8".
Capacity per hr.—3 to 10 tons.
Weight—2600 lbs.

Note—Any engineer or superintendent can trace this drawing and fit in his design. Scale $\frac{1}{4}$ "=1 foot.

Scale drawing of No. 2 was published in March 22d issue. Write for copy.

The Brainard Pulverizer

occupies small space, is compact, economical and efficient. Low in maintenance cost—no screen troubles. Made in four sizes.

Write for further information

MIDLAND CRUSHER-PULVERIZER COMPANY
OLD COLONY BUILDING CHICAGO, ILLINOIS

You Wouldn't

order a duplicate crane if the first wasn't satisfactory? Neither would the Niles Sand, Gravel & Rock Co., Niles, Calif.



We have their order for a second "Ohio" crane—they have given the first "Ohio" three years' hard service test, and it made good.

90% of the "castings" are basic open hearth steel

Write for Catalogue No. 11

Ohio Locomotive Crane Co., Poplar St., Bucyrus O.

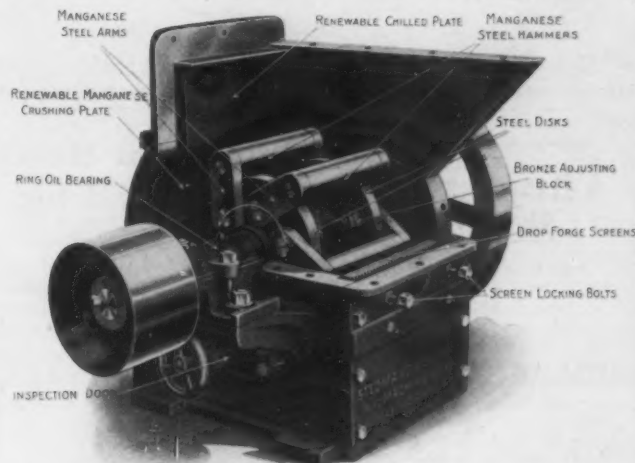
38 Church St.....New York	Edward R. Bacon Co.....San Francisco
Fisher Bldg.....Chicago	Contractors Equip't Co.....Seattle, Portland
Homo Life Bldg.....Washington, D. C.	N. C. Walpole.....Birmingham, Ala.
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A Difficult Pulverizing Problem Solved

Grinding Sandstone Economically
is one of the features of

The Stedman Roller Hammer Pulverizer

No screening bars used—Minimum wear and tear
—No limit to capacity—Strong and durable



Write today for further information as to why the Stedman Pulverizer means economy and efficiency for you.

STEDMAN'S FOUNDRY & MACHINE WORKS

(Manufacturers of disintegrators, pulverizers, grinders, mixing machines of all kinds, Dump Cars, Shaker and Revolving Screens, Elevators, Conveyors, Pulleys and Sprocket wheels. Designers of complete crushing, grinding, mixing and screening plants.)

Established 1834 AURORA, INDIANA, U. S. A.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

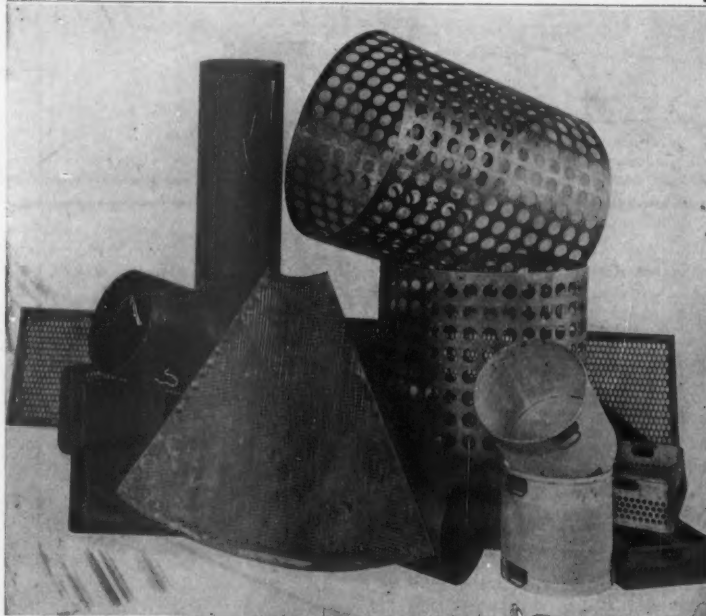
The Toepfer Hydrator

was two years in continuous use at one plant working ten hours daily before being put on the market. Another machine installed last season will pay for itself in one year at its present rate of saving over former methods. This machine was started by an inexperienced man and turned out a first class product from the very first day. THAT SHOWS THE SIMPLICITY OF THE TOEPFER HYDRATOR.

W. Toepfer & Sons Co.
MILWAUKEE

PERFORATED METAL

Steel Screens ∴ ∴ Iron and Steel Work



ELEVATOR BUCKETS, STEEL TANKS, ETC.
W. TOEPFER & SONS CO.
84 Menominee St. ESTABLISHED 1855 Milwaukee, Wis.

HYDRATED LIME

Its Marvelous Increase In Consumption

The Kritzer Service

Any lime can be successfully hydrated by our process; but whether your lime can be hydrated and successfully marketed is another question. We study your proposition and the possibilities of its commercial success, and advise you accordingly. Our ten years' experience in the business is a valuable assistance in this. Ours is not a mail order proposition. We investigate our customers' proposed plant thoroughly before we will enter into a contract with them. We turn down more prospects than we advise to go into the business. We can't afford to have any failures. Our customers' success is our success.

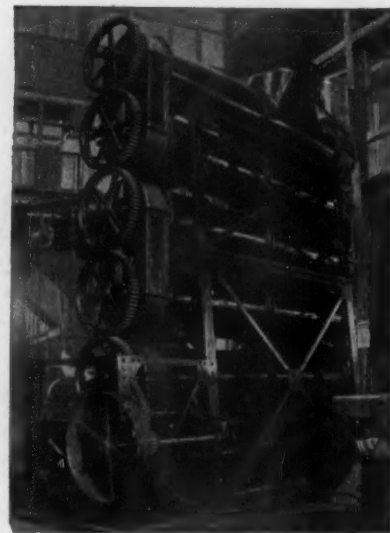
WRITE TO US

Are You Meeting the Increasing Demand for Hydrated Lime?

There is nothing forced or unnatural about the growing popularity of this product. It is a natural growth resulting from a widespread awakening to the advantages of Hydrated Lime for a variety of uses—as waterproofing for Concrete, in wall plaster, and in almost every case where lime is called for. In hydrated form it is weatherproof, more easily handled, and better adapted to modern methods, both of commerce and construction. A continued growth of the demand may therefore be expected.

The Kritzer Way

insures a product which will hold a continued place for itself on the market. We install plants complete, designed by our own expert engineers to meet your local conditions and turn out a uniform grade of Hydrated Lime of the highest standard, and with the greatest economy in cost of production. The Kritzer Continuous Hydrator, and the accessories installed with it, are the recognized standards in this line.



KRITZER CONTINUOUS
PROCESS

THE KRITZER COMPANY Chicago, Ill.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



The Erie—The "REPEAT ORDER"—Shovel

The men whom we "sold" their first ERIE'S, last year, are "buying" their second and third, this season.

Ask for the "Blue List" of ERIE owners—those who have found the

Erie Revolving Shovel

to be all that we claim for it—plus.

You owe it to yourself not to buy a shovel for the 1916 season until you have looked into this one thoroughly.

ASK FOR BULLETIN B-14

BALL ENGINE COMPANY, ERIE, PA.



Clyde Hydrator with Hood
"The common sense way"

SIMPLICITY IS THE KEYNOTE OF SUCCESS

IT does not take a "master mind" to install a CLYDE Hydrating plant, nor does it take a "high priced" engineer to run one. If **YOU**, Mr. Lime Manufacturer, realized how simple it is to obtain a PERFECT HYDRATE, with the CLYDE HYDRATOR you would place your order with us by FIRST MAIL. Write us today—NOW, and let us explain to you what CLYDE PROCESS hydrated lime is and how to obtain the best results, then

Use your own judgment—it's up to you

H. MISCAMPBELL, Duluth, Minn.

Patentee and Sole Manufacturer

A South American Installation



4 Keystone Kilns, Companhia Fabricadora De Cal
Sao Paulo, Brazil

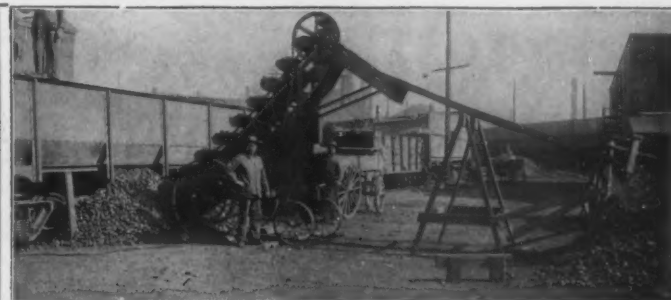
Another important lime plant erected by the Steacy-Schmidt Manufacturing Company is that of the Companhia Fabricadora De Cal, Brazil. A life long experience in the lime producing field insures the present success of this installation.

The engineering department of the Steacy-Schmidt Mfg. Co. are at the services of any firm interested in efficient methods for crusher plants, lime kilns and hydrating plants.

"Success Builders for the limestone industry"

Steacy-Schmidt Mfg. Company
York, Pennsylvania

Manufacturers of the famous Keystone kilns—183 now in use



(Patented)

Unload Your "HAISS" DIGGING WAGON LOADER
Cars with
Trap rock, sand, gravel, coal, coke, etc., can be unloaded from cars or loaded into your trucks at a cost of less than one cent per cubic yard for gasoline or electricity. Capacity one yard per minute.

Write for price and descriptive matter

The George Haiss Mfg. Co., Inc. 146th St. & Elder Ave. New York City



In Successful Operation

The Negley Excavator

The dragline slack cableway excavator for all operations—discharges fast or slow as desired at the mast or anchor.

Economy in Operation and Maintenance

Indianapolis Cable Excavator Company 216-18 Mass. Ave.
Indianapolis, Ind.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Why Not Modernize Your Yard?

You may have the latest type of Crushers, Auto Trucks, etc., but if your equipment does not include a



McMYLER INTERSTATE CRANE

to handle materials, shift cars, place your screens, load trucks and a hundred other things you are losing a legitimate part of your profits. We will be glad to submit figures if you are interested in improving your yard conditions. Bulletin on request.

Address inquiries to
the nearest office

The McMyler Interstate Co., Dept. P-5, Cleveland, Ohio

Chicago, New York
London

"Shut Downs" reduced to a minimum with DULL GRAVEL WASHING EQUIPMENT

Here is what the owner says about this Dull designed plant:

"The plant you designed for us has greatly exceeded our expectations from an efficiency standpoint. The plant has now been in operation for two years; during this time we have never been shut down to exceed two hours, account of break downs or other equipment troubles.

"We are proud of this record and write you about it, in appreciation of the service you have given us in reducing our shut downs to a minimum."

(NAME ON REQUEST)



We are engineers and the only specialists in the design and manufacture of gravel washing equipment. Write for our catalog, "Plants for Washing Sand and Gravel"

THE RAYMOND W. DULL COMPANY

1914 Conway Building, Chicago, Ill.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



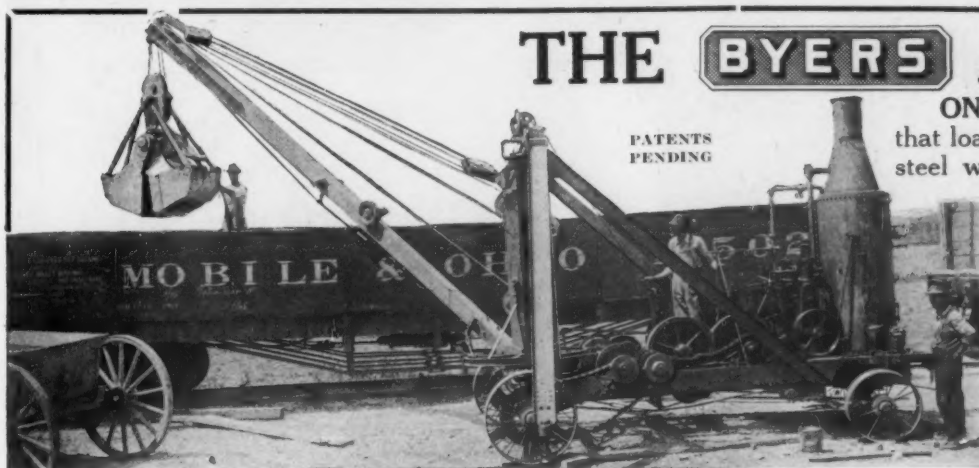
YOU WILL DO BETTER
With an **OSGOOD**

Osgood "18" $\frac{3}{4}$ yd. Traction revolving steam shovel is the practical shovel for the lighter class contracting, such as road building, cellar excavating, sewer trenching, stripping, gravel pits, etc.

Osgood "43" $1\frac{1}{2}$ yd. Traction Steam Shovel with spur gear drive, for quarry and heavy contract work.

Write us your requirements

THE OSGOOD CO., Marion, O.



THE **BYERS** AUTO-CRANE

PATENTS
PENDING

ON BROAD TRACTION WHEELS
that loads and unloads loose materials, timber, steel work, etc., from cars and wagons and replaces 20 men.

IS WORTH THE PRICE

Will travel any place a motor truck will go. Write us.

Chicago Office.....1440 Monadnock Bldg.
Cleveland Office.....601 Sincere Bldg.

The John F. Byers Machine Co.

310 SYCAMORE ST., RAVENNA, O.

(Hoisting Engines and Derricks)

How Some Sand & Gravel Operators Save Money



$\frac{1}{2}$ yard scraper delivering coarse gravel to belt conveyor

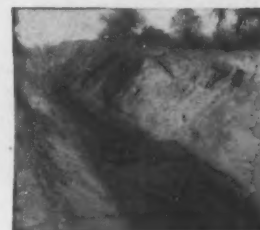
The Sauerman Bottomless Power Scraper will deliver to field conveyor, elevator, cars or storage pile. It reduces the number of times that the field conveyor must be shifted and at the same time reduces operating expenses.

The
Sauerman
Bottomless
Power
Scraper



$\frac{1}{2}$ Yard Scraper
With Front
and
Rear Bridle
Chains

One man operating a double drum hoist controls the digging, conveying and dumping. Our engineers are at your service in the study of sand and gravel problems. Write us.



1 yard scraper dragging load of sand through cut



1 yard scraper delivering sand direct to cars

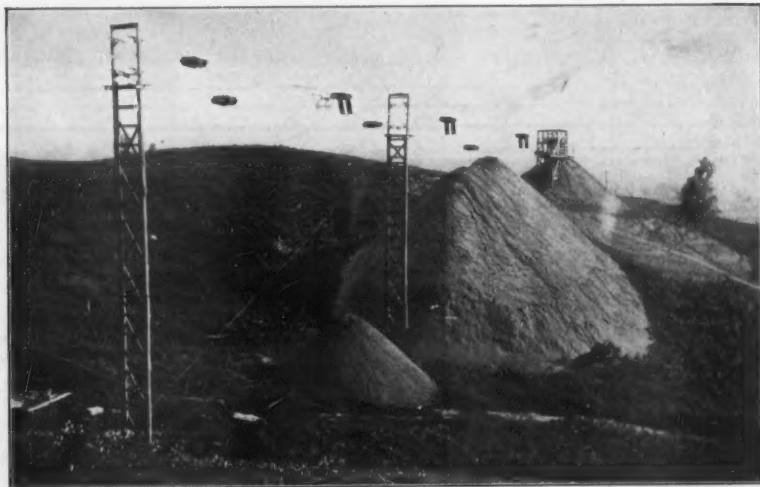
Sauerman Brothers, 1140 Monadnock Block, Chicago, Illinois

Manufacturers of Cableway Excavators, Power Scrapers and Cableway Accessories

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Distributing Material to Storage Pile or Spoil Bank THE LOOP LINE TRAMWAY

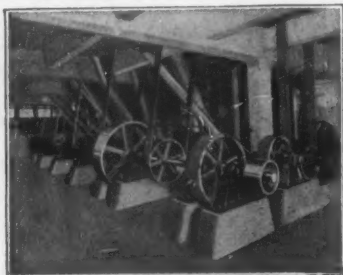
with its continuous procession of barrows may be readily adapted to the distribution of material anywhere along the line by the simple expedient of equipping the barrows with



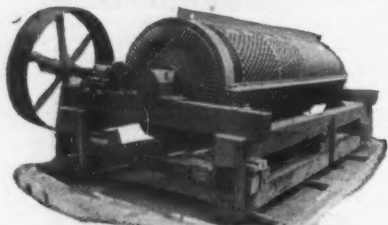
drop bottoms and the track with a movable tripping device which automatically unlatches the bottoms at any desired point. This is but one of many services to which Loop Line Tramways are adapted.

*Let Us Help You with
Your Problem!*

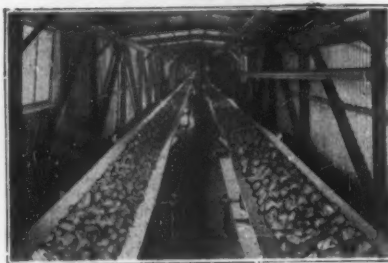
Ambursen Company
61 Broadway New York City



Complete power transmission equipments of all kinds



Revolving screens of every type for every purpose



Belt conveyors for any material. 10 to 60 inches wide.

Essential Factors

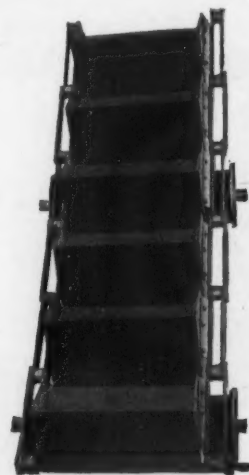
In Stone and
Gravel Plants

IF you have investigated the most efficient methods of handling your material—if you have consulted with experienced engineers on the subject—and if you are obtaining 100% capacity in production, you are using

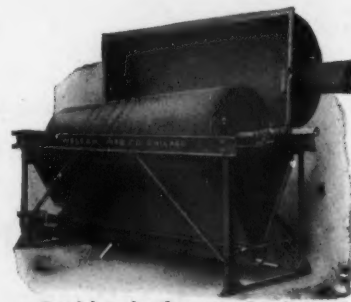
**WELLER-MADE
EQUIPMENT**

If you are not, let us discuss these opportunities for increased efficiency with you. Write for General Catalog P-20 and further information.

WELLER MFG. COMPANY
CHICAGO



Heavy bucket elevators up to 84" wide and 36" pitch



Special enclosed screens for dusty or fine materials

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



The Lakewood Bucket

Means more than just "a bucket"

These are some of the facts that you should remember:

¶ That back of the Lakewood Bucket is 18 years of engineering study and experience:

¶ That back of the Lakewood Bucket is an engineering service that understands your particular proposition and is ready to assist you in meeting **your own conditions** in the most satisfactory manner.

"A bucket that does all that is claimed for it."

The result of using a Lakewood Bucket is **economy and efficiency.**

Write for Further Information

THE LAKEWOOD ENGINEERING CO.
CLEVELAND OHIO

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



How Do You Want Your House to Look?

ON'T you want it to have character—to have, inside and outside, those qualities which suggest that it is a *home*—not merely a place to live in?

Don't you want it to have individuality—to express your artistic taste and at the same time be in perfect harmony with its natural surroundings? Then make it a Medusa White House.

USE FOR THE EXTERIOR FINISH

Medusa Stainless White Portland Cement

The Sandusky Cement Company

Write today for our free booklet, "The Medusa White House."



Dept. V-1
Engineers Bldg.
Cleveland, Ohio

DIRECT HEAT

DRYERS

FOR

**Bank Sand, Glass Sand,
Rock, Clay, Coal, Etc.**

All Mineral, Animal and Vegetable Matter

We have equipped the largest plants in existence and our dryers are operating in all parts of the world. Write for list of installations and catalogue
S. C.

AMERICAN PROCESS CO.

68 William St., NEW YORK CITY

prepared?



The spring drive is on.

Will the first engagement with spring business leave your cement warehouse empty?

Will the long summer campaign find you lacking the ammunition you require for insuring a successful season?

Lehigh service will get your cement to you when you need it.

Lehigh advertising will carry the campaign of permanent concrete construction successfully into the trenches of your prospects.

Be Prepared.

LEHIGH PORTLAND CEMENT CO.



CONCRETE FOR PERMANENCE

MILLS:

Ormrod, Pa.; West Coplay, Pa.; Foglesville, Pa.; New Castle, Pa.; Mitchell, Ind.; Mason City, Ia.; Metairie Falls, Wash.

OFFICES:

Allentown, Chicago, Spokane, New York City, Philadelphia, Boston, Minneapolis, Jacksonville, Mason City, New Castle, Buffalo, Pittsburgh.

12 Mills—Annual Capacity Over 12,000,000 Barrels

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Rock Products and BUILDING MATERIALS

INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVII.

CHICAGO, APRIL 22, 1916.

Number 12

PUBLISHED SEMI-MONTHLY.

DEVOTED TO

Quarry Products, Cement, Lime, Plaster, Sand and Gravel, Clay Products and Building Specialties—Fireproof Building and Road Construction.

THE FRANCIS PUBLISHING COMPANY.

EDGAR H. DEFEBAUGH, Prest.

Seventh Floor, Ellsworth Bldg., 537 So. Dearborn St., Chicago, Ill., U. S. A.
Telephone: Harrison 8086, 8087 and 8088.

EDITORS:

EDGAR H. DEFEBAUGH. FRED K. IRVINE.

GEORGE A. OLSEN, Editor Retailers' Section.

H. F. AKE, Secretary.

DRUSUS H. NICHOLS, Advertising Manager.

Communications on subjects of interest to any branch of the industry are solicited and will be paid for if available.

Every reader is invited to make the office of Rock Products and Building Materials his headquarters while in Chicago.

Editorial and advertising copy should reach this office at least five days preceding publication date.

TERMS OF ANNUAL SUBSCRIPTION.

In the United States and Possessions.....\$1.00
In all other Countries in the Postal Union.....\$1.50
Subscriptions are payable in advance, and in default of written orders to the contrary, are continued at our option.
Advertising rates furnished on application.

Published on the 7th and 22nd of each month.

Entered as second-class matter July 2nd, 1907, at the Postoffice at Chicago, Illinois, under act of March 3rd, 1879.

Copyright, 1916, by E. H. Defebaugh.

Your auto trucks will move more of your tonnage this year than last, and each succeeding year will see mechanical transportation for building materials growing to larger proportions.

The organizations of the local building material dealers is everywhere having the support of the manufacturers, and it is now up to every dealer who considers himself to be a progressive man, to join in the association movement and be a part of the largest success that is being organized and perfected, both in the East and in the West.

Reports that come to us from every part of the country from those who are engaged in building material and kindred lines constitute the complete chorus of the delightful opera of "Prosperity." In every report there is also a grand finale to the effect that "prospects were never better." Now, you can't beat that for business conditions, and it will be your own fault if you make a mess of it.

Careful inspection has demonstrated that the batch-a-minute program for the operation of concrete mixers is too fast. Probably it is more than twice as fast as a real good concrete mixture can be produced. With perfectly correct proportions there must be sufficient agitation of the mass to fully develop the "stringy juice," which makes the matrix of the concrete stone. This can be detected by the way the mixed mass flows through a chute having a 30° angle. The concrete mass at one minute's agitation in the mixer will not flow nearly so rapidly as that which is kept spinning for two minutes before it is discharged. The full flocculent condition of the concrete mass is not developed under five minutes from the time of adding the water to the dry material. This is more distinctly noticeable in mixtures to which a small proportion of hydrated lime has been added. There is probably no substitute for the time element in securing a perfect concrete mixture.

Road contractors are beginning their construction operations with these first weeks of spring weather, and that starts the heavy movement of road materials for which preparations have been in progress during the dormant winter period. It is well now to consider labor saving machinery as well as the improvements in transportation of road materials. Both labor and teams are getting shorter and shorter in supply. It is just as well to realize this condition, which exists in every part of the country, and to meet it sensibly by providing the machines before losses are incurred by trying to accomplish the impossible.

Mechanics generally are prone to make plastering mixtures too rich, with the result that shrinkage checks and crazing occurs. If even invisible shrinkage checks are exposed to the weather, they admit moisture which frost develops and so destroys the work. Even if there is no weather exposure, atmospheric variations in moisture and temperature will eventually develop the checks to unsightly proportions. The old-fashioned general-impression formula of three of sand to one of lime, cement or other prepared material is quite impractical, at least in conjunction with the high-grade products that are manufactured today. Five to one, six to one, and even seven to one in some cases, has been found to be the exactly correct proportion to secure that constancy of volume which dries out perfectly and never changes afterwards. This is very largely due to the extremely fine grinding that we have developed for all cementitious products, for we are measuring materials now by the No. 200 screen that were formerly considered fine enough if ten per cent would pass the No. 100 screen. Comparing cement and lime plasters that were mixed twenty years ago three to one with the same type of plaster mixed six to one last summer suggested this observation.

Pollution of streams through sewage disposal is one of the worst uneconomical features of nearly universal practice in this country. It is marvelous to believe that even great cities use for their sole water supply the very streams that are most polluted in this particular way, although it is now well known that no amount of dilution with water can ever dissolve a considerable portion of the organic poisons carried off in sewage. The destruction of fish in polluted streams amounts to the destruction of a natural food product, probably worth half as much to the human family as the crops which are the result of immense investments in capital and labor. If sensibly conserved the free fish food asset supplied by nature would very nearly feed the present population. This is one of the greatest wastes of the many that we have been guilty of as a people for several generations. The pollution of natural streams is not necessary. It is not economical, as it one time seemed to be, for modern sewage disposal systems are a distinct financial asset to the communities using them. The commercial products of sewage disposal plants are extremely valuable and in constant market demand, so that the sewage disposal of any community can be scientifically handled without any cost, but, instead, with great profit. At the same time the danger of the water supply taken from lower levels is eliminated, and nature's tremendous fish food supply is conserved. A society for the prevention of the pollution of natural streams would be of more importance than many of the popular agitations that have swept the country in recent years. Think this over and give it a boost whenever you get a chance, because it appeals to you and every other citizen.

WITH YOU and ME

E. P. Worden, formerly of Fred M. Prescott Steam Pump Works, Milwaukee, has been appointed chief engineer of Henry R. Worthington, Harrison, N. J.

Louis J. Graydon has gone to the selling force of the Allentown Portland Cement Co. He will travel Rhode Island, Maine, New Hampshire and Vermont.

Lucius E. Allen, consulting and constructing engineer, Bellevue, Ont., recently announced the removal of his office into more commodious quarters in the Canadian Bank of Commerce building, that city.

Charles E. Schiple, Atlanta, Ga., is now the sole owner of the concern of Schiple Bros., well-known dealers in builders' supplies and builders' specialties. George W. Schiple having retired from the business.

P. P. Bourne, formerly chief engineer of Blake & Knowles Steam Pump Works, East Cambridge, Mass., is again associated with the International Steam Pump Co. in connection with special engineering work located at the company's main office, 115 Broadway, New York.

While on a little journey through the Southland not long ago, a member of the ROCK PRODUCTS AND BUILDING MATERIALS staff encountered one of the "Big Moose" in the curb line in Chicago, namely, W. H. Powell, of Powell Bros. He was accompanied by Mrs. Powell and had been to Cuba, Florida, French Lick Springs and other places of rest and amusement. The two men engaged in golf at French Lick and Powell knocked out a 316-yard drive, his first this year. It is the impression of the newspaper man that some golfers of the Chicago "deestriet" will have to get busy if they want to successfully compete with him as a golfer this summer. Look him over, his picture is printed herewith.

E. A. Foster, who represents Samuel Cabot, Inc., of Boston, has been down to Old Mexico, where he was very busily engaged assisting his agents, Sheehan & Baldrige Co., of El Paso, Tex., to put invisible coatings on the motor trucks that are carrying the supplies to Pershing's army. Foster has all kinds of colors, from wonderful blacks to those invisible military colors which he has kept concealed until the present time. The weather was very warm at El Paso, as well as at Columbus, N. M., but he is not to be disturbed at such trifles, and it is said he never allowed a single auto truck to leave that wasn't properly coated. In this big undertaking Mr. Sheehan worked as hard as the gentleman from Boston. If it had not been for these two hard-working and patriotic citizens there is no doubt but that the army would have perished for lack of supplies, for the route is said to have been infested with large flocks of Mexicans who had no other weapons but 100-peso bills, which they threw at people in chunks to frighten them. After all of the auto trucks were well taken care of, Mr. Foster remembered that he had an engagement with Maitland, of the Colorado Builders' Supply Co., in Denver, and has been rusticated in the mile-high city ever since. Maitland had his temperature taken yesterday, and reports that Mr. Foster may leave for the east as soon as he recovers from the shock of the operation.

Arthur Wellington has taken over the business of the Stony Brook plant of the Waltham Trap Rock Co., Waltham, Mass., on which he has taken a lease.

Frank Adams Mitchell, vice-president and general manager of the Ceresit Waterproofing Co., Chicago, is touring western cities. He left Chicago on March 23 for Denver, Salt Lake City and Pacific coast points and is expected to return the latter part of April.

W. F. Houck, of Bluefields, W. Va., has been made manager of the Southern Tile & Brick Works, near Jackson, Tenn. This is one of few concerns in



WILLIAM POWELL, THE GOLFER.

the South manufacturing fire brick. The plant, which now has a capacity of 20,000 brick a day, is to be enlarged to take care of an increasing demand.

Louis J. Lind, vice president of the Witherow Steel Co., one of the leading concerns in reinforced concrete work in Pittsburgh, Pa., gratified his friends lately by having his photo appear in the business men's section of the Pittsburgh Dispatch. He was educated at the Ohio State University and is one of the "comers" among the reinforced concrete men of this city.

William I. Brown, of the Davenport & Brown Co., Cincinnati, Ohio, was the speaker at the closing coffee party of the Boston Master Builders' Exchange. He gave an interesting talk on good work and how to secure it. In connection with the session there was an exhibit made of veneers which was kept on view at the exchange for a week.

The Pittsburgh Lumbermen's Club, which now has more than fifty members and which includes a large number of builders' supply men in Greater Pittsburgh, elected the following officers recently for the ensuing year: Elmer A. Diebold, of the Higgins Lumber Co., president; Bruce Hill, of the E. M. Hill Lumber Co., vice president; S. W. Means, of the S. W. Means Lumber Co., treasurer, and Carl Vandervoort, secretary.

Gravel and sand operators at Tennessee points are more active in mining, construction and building material lines.

The Hydrated Lime Bureau has moved its headquarters from the Oliver building to the Arrott building at Fourth avenue and Wood street, Pittsburgh, Pa.

"The spring so far has been almost ideal and conditions could not have been better for early season business, and most dealers have had from a comfortable to a rushing business and more tentative building in prospect than for many years at this season," says E. E. Hall, secretary of the Nebraska Lumber Dealers' Association, Lincoln, Neb. "Of course as the farmers get busy in the fields the yard trade will slacken to some extent, but it promises to be a fair volume until mid-summer."

"If there are those who still doubt that we are living in a rapid-fire age, let him consider the motor truck industry," says C. R. Norton, truck sales manager of the Packard Motor Car Co. "The present demand for commercial expediency is resulting in a greater volume of truck business than the world has ever before seen, and there are no indications that there is to be anything but an increase in that demand. Practically every large concern in the country is building up its transportation equipment by the purchase of commercial vehicles."

A party of New Orleans building material men, in tow of the Jahnekes, visited the new gravel plant of the Roseland Gravel Co. at Roseland, La., last month. At the time of this visit, the second set of screens was just being put in, which means that the plant actually started operating on March 12. It is understood that the plant will work full capacity for some time to come. The plant is filling an order for 30,000 yards of gravel to be used in the construction of the new \$1,000,000 municipally-owned grain elevator.

C. E. La Vigne, formerly special agent of the Federal Trade Commission and special investigator for the Bureau of Corporations of the Standard Price Question, has been engaged as field representative by the American Fair Trade League, whose home office is in the Fifth Avenue building, New York City. During the past year Mr. La Vigne has been director of the Bureau of Investigations of the New York Tribune. Because of his experience he is fully equipped to discuss the different phases of the closely related evils of predatory price cutting and dishonest advertising and the proposed remedial legislation in the form of the Stephens-Amhurst bill.

Members of the Pittsburgh Builders' Exchange are making a careful study of the new city building code which has been prepared by the building code commission and which will be presented to the city council. A committee consisting of J. H. Toupet, chairman, George C. Webb, H. L. Jennings, F. F. Schellenberg and Ira A. Mann has been very active in considering every phase of the code and at a meeting of the Exchange on April 12 made a report stating the objections they found to the document. Their work was approved by members

of the Exchange. When the code is presented to the council there will be public hearings before that body and the Exchange committee will no doubt make every effort to see that the articles objected to are revised in a satisfactory manner.

Garnett B. Appo, the newly-elected president of the Mid-West Cement Users' Association, has high hopes for the development of the association during the year 1916. It is his intention to devote considerable time and attention to the association work during the year, and it is his belief that the next convention will be the best in the history of the association.

Percy H. Wilson, secretary of the Association of American Portland Cement Manufacturers from 1908 to 1915 and member of the American Society of Civil Engineers and the American Society of Mechanical Engineers, has opened an office for consulting work at 1232 Land Title building, Philadelphia, Pa., where he will specialize in cement, concrete, concrete roads, dredging, foundations,

load from the Sawyer Lumber Co. you get a certain satisfaction that includes many things to your advantage." He then describes the company's policy on service, quality, prices, deliveries and advice.

Big steel and reinforced concrete stands will be erected in conjunction with numerous buildings at the proposed speedway around the lake of the Birmingham Country Motor Club of Birmingham, Alabama.

J. W. Thompson, the New Orleans contractor with offices in nearly every principal city, bought the first ticket that was sold over the counters of the new Texas and Pacific passenger terminals in New Orleans. Mr. Thompson's firm was responsible for most of the construction work on the depot, which cost more than \$5,000,000. Profit Island gravel was largely used.

S. G. Taylor, who has been representing the Lehigh Portland Cement Co. in New York state has recently become affiliated with the Pennsylvania Cement Co., of New York City, whose mills are located at Bath, Pa. In addition to his old territory he will cover many other points in the Empire State. Taylor is a veteran at the selling game and has established a reputation as a business getter. His straight-forward manner of doing business has secured for him innumerable friends and connections among the buying trade.



S. G. TAYLOR.

educational publicity, cost accounting and commercial organization.

The Sawyer Lumber Co., Sawyer, Wis., is furnishing its customers with a farm and building book of 160 pages and cover, which describes and illustrates farm residences, barns and outhouses of various kinds. The question of raising live stock, arranging the garden, organizing community clubs, and other topics of interest to farmers are treated in detail. Every page is illustrated with one or more pictures and, outside of the covers, the book carries no advertising. The back cover sets forth the object of the company in presenting its customers and friends with the book and the verbiage is characteristic of H. B. Isherwood, general manager of the concern. An extract reads, "To seek, serve, satisfy—these are our greatest ambitions in serving the people of this community and for this reason we have gotten out this book. It contains information of interest to every individual in this community and will enable you to develop your ideas and insure you better crops, better live stock, better farm buildings and better homes." In another instance Mr. Isherwood refers to the slogan he adopted for his company some time ago, "one piece or a carload," in the following words: "You may have the idea that we mean we are willing to sell either a small order or a large one. We mean that and much more besides. We mean that whether you buy one piece or a car-

load from the Sawyer Lumber Co. you get a certain satisfaction that includes many things to your advantage." He then describes the company's policy on service, quality, prices, deliveries and advice.

It's an ill-wind, indeed, that hasn't a silver lining, as Josh Billings would say. In this case the silver lining played a double header. Some two score years ago a young and promising Easterner started for the Northwest, but tarried at Akron, Ohio. So enamored did he become with the potential seat of manufactured rubber culture that he besought himself a newspaper job then and there. It being necessary to interview a brother of no less than Frank Pixley, the now eminent father of drama and musical comedy, in order to officially affix himself in the treasurer's good graces, our young Go-Wester journeyed to the aforesaid's home. Mr. Pixley was ill. Before the interview had concluded itself, an Akron doctor essaying the role of heavy villain, announced that the house was quarantined and that Mr. Pixley had the small-pox. Needless to state the young job aspirant remained as a guest. And so in the course of time he joined the staff of the newspaper and was also joined in wed-lock to Mr. Pixley's sister—hence the aforementioned double lining. This is the story of how E. C. Tibbitts, who on April 7 concluded his nineteenth year as the one and only advertising manager which the B. F. Goodrich Co. has ever had, reached Akron. He reached the Goodrich factory before they'd had a chance to hang the receiver back on the hook after calling up his paper and inquiring "Have you a bright young man whom you could recommend to write advertisements?" The growth of the B. F. Goodrich Co., which is the largest rubber factory in the world, and produces over 20,000 different articles of rubber, including auto, motorcycle, bicycle, truck and carriage tires, hose, belting, packing, molded goods, raincoats, boots and shoes, water-bottles, and, in fact, "everything in rubber," is largely attributed to its progressive advertising policies. In fair weather or foul, Goodrich advertising has stood forth as prominently and continuously as Gibraltar. The Goodrich Co. has always consisted of strong believers in advertising because they have seen their business multiply and prosper under the sun and rain of publicity. In no other way could they have told so many millions of people about the goodness of Goodrich goods, in so short a time, or so economically. Their advertising has made people want rubber goods made by Goodrich, and what the public wants it gets, year after year. Today their great factories are at work night and day.

Each year they invest more and more money in advertising and each year are forced to build and build to care for increasing business.

W. R. White has been chosen president of the Bristol Brick Co., Bristol, Tenn., to succeed J. H. Fleming, who has resigned. Plant operations will soon be resumed.

"When the history of the Mexican revolution is written, the American motor car will have a very prominent part in its pages," says H. P. Branstetter of the Kissel-Kar. Not only in military operations has the automobile figured conspicuously, but it has saved many innocent non-combatants from the murderous brigands preying upon the land in that unhappy country."

On account of the fact that structural steel is a hard material to obtain in New Orleans, architects and building material men are specifying concrete in a number of instances. Several large New Orleans construction jobs will be of concrete be-



C. E. TIBBITTS.

cause of this fact. Notable among these buildings is that of the Sewerage and Board building, which is to be erected by the city adjacent to the City Hall.

F. O. Gulley, president and general manager of the Ozark White Lime Co., Fayetteville, Ark., is very optimistic in referring to prospects in the lime business for 1916. He has just completed a two-weeks' trip in eastern Oklahoma and western Kansas where he found business among the retailers in a healthy condition. "March has been an exceptionally good month with us and we are in good shape to manufacture all the lime that the trade will call for, and we expect a prosperous year," said Mr. Gulley.

Close to 1,000 children from the poorer, congested sections of the city will be enabled to get out in the country and enjoy a week's stay during the hot summer days, through the philanthropy of the Philadelphia Master Builders' Exchange. At a recent weekly luncheon and meeting held at the headquarters of the exchange a movement was inaugurated to raise \$2,000 for this purpose. The money will be raised by subscription from members of the exchange and from the proceeds of several baseball games between the exchange and the Lumbersmen's association of Philadelphia and other similar organizations from nearby cities.

The RETAILER

Car Shortage and the Building Material Business

The shortage of freight cars which has been predicted ever since last October, arrived in all seriousness during February and March. The report of the American Railway Association for March 1 showed a shortage of 62,275 cars as against a total surplus of 41,724 cars. This is the largest shortage recorded at this period of the year since 1907 and is a net shortage for the first time since the fall of 1913.

Complaints of a scarcity of freight equipment were heard in certain sections of the country last October, but until the last two months the shortage has not been considered severe. The month of February, however, reduced the surplus 12,000 cars and increased the shortage by almost 30,000 cars. As the shortage consists mainly of box cars, the cement, lime, hard wall plaster, brick and other clay product manufacturers and dealers have naturally been hard hit. The most aggravated cases of box car shortages come from the west, while in the east there is a shortage of coal cars, and as a result, the shipments of sand, gravel and crushed stone have naturally been delayed.

The shortage of cars in the west is attributed to the large export business and to the lack of bottoms to carry the freight across the water. As a result, cars which have carried grain and other export produce have been tied up in the east and are being practically used for storage purposes rather than for the transporting of the nation's business.

Statistics show that in New York, New Jersey, Delaware, Maryland and eastern Pennsylvania there is a large shortage of coal cars, amounting to almost 6,000. This has been materially reduced since March 1, however, as figures for that date show a shortage of 10,000 cars. There was practically no shortage reported on the New England lines. In Iowa, Illinois, Wisconsin, Minnesota and the Dakotas there is a reported shortage of 6,000 box cars. On March 1 the shortage amounted to 14,000. Canada is in need of box cars, there being an average shortage of 8,000 for the months of February and March. There are slight shortages in other parts of the country, but the figures do not reach very high.

Surpluses are reported in the southeastern part of the country, there being on April 1, 4,700 available box cars in the states of West Virginia, Virginia, North and South Carolina. At the same time, there was a surplus of 3,600 coal cars in the central west and a surplus of 7,500 miscellaneous cars on the Pacific coast.

A comparison of figures relative to the car situation between April 1, 1915, and April 1, of this year, is interesting. In 1915 there was a total shortage of 357 cars. The total shortage this year is 43,271. Last year there was a surplus of 327,441 cars as against a surplus of 46,921 this year.

There seems to be relief in sight, however, based upon the figures submitted by the American Railway Association. The shortage of cars dropped from a total of 62,275 on March 1, to 43,271 on April 1, and the surplus was increased from 41,724 on March 1, to 46,921 on April 1. This places the net surplus of cars at 3,650 cars. If the pro rata reduction in car shortage is maintained, the situation will soon right itself and the movement of materials for construction purposes will again assume normal conditions.

The car situation of the country can be considered one of the best barometers of business in existence.

It is a well-known fact that manufacturing establishments running with eight-hour shifts two years ago are now maintaining three crews and operating twenty-four hours a day. Much of this material has been shipped east for export and is partially, at least, responsible for the congestion of traffic in that part of the country and is largely the cause of the embargo placed by the New York, New Haven and Hartford railroad, as well as all New England lines and all eastern trunk lines.

With the object in view of releasing cars as soon as possible and thereby placing them at the disposal of the public for transportation purposes, the Interstate Commerce Commission has granted permission to carriers to establish, effective April 1 to June 14, of this year, a revision of the demurrage rules. The demurrage charge, which heretofore has been at the rate of \$1.00 per car per day after forty-eight hours free time, has been increased to the following scale: Forty-eight hours free time, as before, three days, demurrage at \$1.00 per car per day and a charge of \$2.00 per car per day thereafter. It is claimed by the railroads that this charge is placed solely for the purpose of creating an incentive to release cars as soon as possible, but in reality, it amounts to paying the railroads for extra service and acts as a penalty on the individual or firm forced to hold cars beyond the free-time limit.

Manufacturers of cement and other building materials have been urging retailers to order their supplies as far as possible in advance, so that later orders may be given as much time for delivery as possible. Where dealers have followed the advice of the manufacturers, the present car shortage situation has had practically no effect on the delivery of materials and supplies have been furnished customers when wanted. In some parts of the country, however, the car shortage situation has been keenly felt, despite the fact that warehouses and yards were well stocked during the late winter months.

There is every indication that the present volume of business will continue throughout the year, and if this is the case, there will probably be more difficulty in getting delivery of goods later in the year than has been experienced during the first three months. The question of delivery will probably be a greater factor than that of price. From reports, this condition prevails principally in the east.

Reports received in the office of ROCK PRODUCTS AND BUILDING MATERIALS during the last week describe the situation as it confronts the building material industry and as it affects the retail dealer, in particular. Some of these reports are as follows:

The Garden City Sand Co., Chicago, Ill.: "The car proposition is a serious one, and is getting no better. On our fire brick shipments since the first of the year it has been almost impossible to get a sufficient number of empty cars to take care of our orders, and, owing to the frightful congestion of export freight from Toledo and Cincinnati, Ohio, and from Pittsburgh territory and east thereof, it is almost a physical impossibility to get westbound cars over the road after they are loaded. Our shipments originate in Pennsylvania, Ohio and Kentucky districts. We have no eastbound shipments to speak of, all of our business is westbound. Our sand shipments are beginning to pick up as the weather conditions improve and we are experiencing trouble in

keeping our pits supplied with a sufficient number of empty cars to move this commodity."

Standard Portland Cement Co., Birmingham, Ala.: "The car situation throughout the entire south is exceedingly unsatisfactory and indications point to a slow improvement in these conditions, according to the railroads. We have not yet suffered to any extent on account of the lack of cars, because we are located on two trunk lines of railways. However, it is with considerable difficulty that we secure sufficient equipment. So far, we have been able to take care of orders promptly."

A. B. Meyer & Co., Indianapolis, Ind.: "The experiences we have had in obtaining the different lines of building materials in which we deal have not been at all satisfactory as to transportation. We also find that we must be very careful in making quotations to our customers, owing to the quick and rapid advancement that the manufacturers are compelled to make. We have slower shipment from the east than from the west, but in both directions, it is keeping us busy to keep our stocks in shape."

J. J. Clarke, Co., Ltd., New Orleans, La.: "To date, the effect of the car shortage situation has not been seriously felt, due, firstly, to quiet conditions in the trade here as compared with previous years and, secondly, to the fact that our connections seem to be well favored with the transportation companies on whose lines their plants are located."

The Cleveland Builders' Supply Co., Cleveland, Ohio: "We understand that a good many industries are suffering through the severe shortage of box cars at this time, but up to the present we have been very fortunate in receiving our goods fairly promptly."

The Wheeling Wall Plaster Co., Wheeling, W. Va.: "We are not experiencing much trouble getting shipments. We stocked up on all material early, and we always order large cars and unload quickly upon arrival, which naturally helps the condition some. Our shippers advise us that the labor shortage is worse than the empty car shortage. Business is fine and we are happy."

Rockland & Rockport Lime Co., Rockland, Me.: "We have not experienced any car shortage this year."

Nebraska Material Co., Lincoln, Neb.: "The only place we have been affected on getting cars is from the Portland cement mills in St. Louis. They have had a little trouble in getting cars, and shipments have been delayed. Plaster mills have had some trouble, but not much, in taking care of us. We are placing our orders as far in advance as possible in order to help out the situation. We are also loading cars very heavily. On cement shipments we have practically loaded two cars in one, loading as high as 290 barrels in a car instead of the regular size of from 125 to 150. This makes it harder to unload, but at the same time it relieves the car shortage situation. This, we think, is a very good thing."

Maryland Lime & Cement Co., Baltimore, Md.: "We have not experienced any trouble up to the present time. Business has been very quiet with us and deliveries slow, therefore, we have not been ordering any quantity of materials from the factories. This may account for the fact that we have not experienced any trouble. We are keeping our warehouses pretty well filled up, as it looks to us as if the car situation during the summer and early fall will be a serious matter."

Des Moines Building Co., Inc., Des Moines, Ia.:

"We have not been troubled in receiving shipments from various points excepting on lime shipments from the south. We have plenty of cars to make shipments out of Des Moines. In fact, we have more at the present time than we can use."

Peoria Fuel Co., Peoria, Ill.: "We are not having much trouble with car shortage in the vicinity of Peoria. We are getting empty cars promptly here, and the only places we have had any delay in shipments have been in the east. We are getting prompt shipments of materials, and have no occasion to complain."

Fritz Jahneke, Inc., New Orleans, La.: "We have been seriously handicapped in securing cars for the handling of our material. Our greatest trouble lies in securing cement from Chattanooga, Tenn. It seems that from other points we are being taken care of."

G. C. Buquo Lime Co., Hot Springs, N. C.: "So far we have not suffered seriously from car shortage, either on inbound or outbound business. During the first quarter of this year we loaded about 400 cars of material, and we believe that we actually lost less than five per cent of our booked tonnage by reason of insufficiency of cars. Our location is exceptionally favorable for loading cars which would otherwise return home empty."

Houston Brothers' Co., Pittsburgh, Pa.: "The greatest difficulty seems to have been in securing cars for shipment of lime in both the Ohio and Virginia fields. However, the shortage seems to be general and is retarding the delivery of all building materials to a great extent."

Indianapolis Mortar & Fuel Co., Indianapolis, Ind.: "Our firm so far has suffered very little from car shortage. Not because there hasn't been a car shortage in this territory, but because of the fact that it was talked of so much by the people with whom we do business that we anticipated our wants as far as possible, and the weather being a little backward, we were able to keep up our stock without any particular inconvenience. We have also done what we could to help the situation by releasing the cars as promptly as possible. The general situation in Indianapolis just now seems to be better than it was some weeks ago, but everybody is anticipating serious trouble in the near future, which we hardly see can be avoided."

St. Paul Builders' Material Co., St. Paul, Minn.: "We have not experienced any difficulty up to the present time as a result of car shortage. The general line of building materials which we purchase have been obtained in about regular times of shipment from the manufacturers with whom we deal."

The Kaw River Sand & Material Co., Kansas City, Mo.: "We have temporarily been compelled to suspend business owing to the damage to our pump

boat in the ice jam the latter part of February. We have recently resumed operations, and so far have not been affected to any extent by any shortage of cars. We experienced some difficulty last December, but nothing of a serious nature."

Composite Brick Co., Jacksonville, Fla.: "We have not been hampered to any extent by car shortage in this locality since the first of the year, as there seem to be cars on hand within a day or two when orders are placed with the railroad companies to set them. We did have some trouble in getting Florida East Coast cars transferred over to the Atlantic Coast Line during February, as they were keeping their rolling stock on the move at that time on account of the movement of Florida fruit and vegetables, but there has been no trouble lately in this respect. Our main trouble has been that the railroad companies, especially the A. C. L., have had their crews on our division overworked. The hard times made it necessary to curtail all expenses as far as possible, and when the spring work began to pile up they still overloaded the switchmen, which made the service exceedingly uncertain, but this has been remedied lately, so there is no complaint now. We are suffering for the lack of building operations here chiefly. There is not much stirring."

Charles Warner Co., Wilmington, Del.: "We have been very fortunate so far, and have not suffered to any serious extent by reason of delay in securing cars. We usually feel the worst pressure during the fall of the year, and are anticipating a very serious condition inside of another two or three months. It hardly seems possible for the country to avoid the worst car shortage in its history during the coming fall, if business conditions continue as they are now running."

The Carolina Pine Lumber Co., Huntington, W. Va.: "The car shortage proposition has affected this market very materially. For the past sixty days our car shipments have averaged from two to three weeks late on account of the car situation, and in one or two cases manufacturers have been sixty days late in making shipments and claim that the car shortage was the cause. Recently, we have had several mills ask permission to ship our stock in open cars for the reason that they could not get box cars in which to load. We understand, however, that the situation is much better at the present time. We business men of this section do not take very kindly to the \$2.00 demurrage proposition. We believe that the car shortage is caused by export business, on account of thousands of cars having been shipped to seaport points, and not sufficient vessels in which to load the stock, and therefore sidings for many miles of these seaport cities are blocked with loaded cars. We hardly feel that con-

cerns in the interior states should have to pay \$2.00 demurrage on account of this fact."

The City Coal & Wood Co., New Britain, Conn.: "Owing to the amazing inefficiency of the operating department of the New York, New Haven & Hartford Railroad Co., insofar as their local handling of freight is concerned, New Britain has been badly crippled in its building business so far this season. We have lost business continually, and are now under embargo, although most of Connecticut is open to shipments. Labor is very scarce and independent. Common labor is too high, and many buildings are being held up awaiting better conditions. Spot brick is selling at \$11.00 per thousand, and lumber is ten per cent higher than last fall. Face brick has been completely kept out since January, the cement supply is exhausted, and New York state wall plasterers are out of the market on account of the embargo and car shortage, mainly because of the inefficiency in railroad handling."

Waldo Bros., Inc., Boston, Mass.: "Our experience so far this year has been that we have not had any difficulty in getting shipments on account of the shortage in freight cars, but we have experienced great difficulty owing to embargoes against eastern roads by western roads."

Daily Stock Record Necessary.

The building material yard of today must be prepared to give its customers the utmost service, not only in supplying them with materials but also in giving them information relative to the possibility of delivering materials when they are wanted. In order to facilitate the work of employees who endeavor to keep a record of materials on hand, various systems of stock records have been installed. There are in use today in the building material industry thousands of different card and book systems and almost without exception each dealer in the country is keeping a record of materials on hand entirely different from his neighbor across the way, or retailers of the same commodity in other states.

One of the most practical stock record sheets is used by a large Chicago building material firm and after the daily reports have been recorded a glance at the card will give information relative to the amount of stock on hand, as well as the amount received and sold during the current month. The accompanying illustration shows the manner in which this card has been designed. Everything entirely unnecessary has been eliminated.

One of these cards is used for each commodity. Space is left at the top of the card for the name of the commodity and for the yard number. The card provides ample space for the records of an entire month and when properly filled in will show the number and initials of car containing commodities which have been received, the extent of the shipment received and the amount sold.

On the card used by the Chicago concern a column is designated by the words "ship to yard." In explanation of this it is necessary to state that quite frequently material is shipped from one yard to another and when supplies are so disposed of they are reported in this column instead of under the "sold" column. The card, which measures five by eight inches, is printed on two sides and thereby keeps together the stock records of the commodity in question for a period of at least two months.

BOSTON BUILDERS GET STARTED.

Boston, Mass., April 18.—Spring's first month opened up with sufficient fairness to let the builders make a good start in Greater Boston. In the last fifteen days the building projects numbered 207, and the total valuation is reported by the F. W. Dodge Co. as amounting to \$3,446,000. Dealers are stocking up with the season going into bud and the release of many consignments by lessening of freight congestion on the railroads.

FORM 52—SM STOCK AT YARD 19									
CAR					CAR				
RECEIVED					RECEIVED				
SHIPPED TO YD.					SHIPPED TO YD.				
SOLD					SOLD				
INVENTORY					INVENTORY				
1				17					
2				18					
3				19					
4				20					
5				21					
6				22					
7				23					
8				24					
9				25					
10				26					
11				27					
12				28					
13				29					
14				30					
15				31					
16									
TOTAL					TOTAL				
INVENTORY					INVENTORY				

DAILY STOCK RECORD CARD USED BY LARGE CHICAGO FIRM.

ADOPTS MODERN MERCHANDISING METHODS.

H. C. Miller, of Vinita, Okla., with yards at Vinita, Dewey, Collinsville and White Oak, is a believer in modern merchandising methods. Mr. Miller calls his establishments "stores." At Vinita, for instance, he has his store in front of two single and two double sheds. His store is one big room. In front are regular display windows in which are displayed articles in stock. There is a door rack six feet by eighteen feet, seven feet high, which was designed by Mr. Miller. This will hold 300 doors. At another place there is provision for window glass. The glass and the doors are in full view of people entering the office. Window sash occupies a 20x24-foot space, a casing and base rack 3x16 feet, and a moulding rack 15x16 feet. Along one side is shelving for paint, varnish, shingle stain, etc. There is no partition in this building. The lime and cement house is at the end of one of the double sheds and opens on one side to the railroad track. On the loading side the platform is level with the bottom of a wagon-bed. Above this warehouse is a fully equipped carpenter shop for the use of local carpenters.

CORMACK OPENS ANOTHER YARD.

The Consolidated Co., which was recently organized in the city of Chicago by Edward K. Cormack, former president of the National Builders' Supply Association, opened its second yard on Monday, April 17. It is located at Ninety-fifth street and the B. & O. C. T. railway, where the company has secured the business and property of the West Englewood Supply & Construction Co., with large barns and warehouses and 600 feet of track.

At this yard the company will carry a complete line of builders' supplies and coal. Ample storage facilities for sand and stone and a good demand indicates a big business in these commodities. The yard will be in charge of James Graham, who has been in the coal and builders' supply business in Gary, Ind.

When Mr. Cormack opened his first yard at Sixty-fifth and State streets last fall his operations were watched with much interest by the building material fraternity of Chicago and his many friends in various parts of the country. The aggressive manner in which he took hold of the business predicted early success and the new venture at Ninety-fifth street substantiates the faith placed in him by those with whom he has done business.

CITY TO STANDARDIZE MATERIALS.

The city of Milwaukee, Wis., through the bureau of standardization of the Citizens' Bureau of Municipal Efficiency, has begun the work of standardizing materials likely to be used in the various city departments, preparatory to the proposed establishment of a city purchasing agent. One of the first investigations is that of lumber, but various other lines, like brick, cement, limestone, asphalt, etc., will be taken up. It has been discovered, for instance, that many times the city departments buy the wrong kind of lumber for a specific purpose. The purpose of the bureau is to provide the city with data by which it can buy efficiently and properly and those in charge expect to ask the manufacturers and handlers of various materials to assist in securing the proper information.

N. F. P. A. TO MEET IN CHICAGO.

The National Fire Protection Association will hold its annual meeting in the auditorium of the Insurance Exchange Building, Jackson boulevard and La Salle street, Chicago, May 9 to 11. Secretary Franklin H. Wentworth anticipates a good attendance on the part of members from all parts of the United States and Canada.

Need Not Sell Too Cheap.

By Thomas F. Porter

Should you have anything to sell,
Its worth do not o'erestimate;
Neither would it be wise and well
Its value much to understate.
Would you an honest purpose show,
Bestir yourself from sluggish sleep;
Don't make your asking price too low,
And do not sell your goods too cheap.

Or would you with your neighbor trade,
Seek not a bargain sharp to strike;
There is a course, if but obeyed,
That will be just to both alike.
If, as each one shall fairly sow
They each shall just as fairly reap,
Neither need make a price too low,
Nor either sell his goods too cheap.

Or would you barter and exchange
The things you have with all mankind,
Although the prices greatly range,
A common level all might find.
Should avarice have an overthrow,
And wrong into oblivion creep,
None needs to make his price too low,
No one need sell his goods too cheap.

So, in the realm of thought and mind
Toward which our higher natures rise,
We on examination find
This law of trading still applies:
Should men exchange their best thoughts so
That all the Golden Rule would keep,
No one need set his price too low,
And no one sell himself too cheap.

SUGGESTED CAMPAIGN IN FAVOR OF STEVENS BILL.

By James A. Arkin.

Much has been heard of the Stevens bill recently, and while sentiment is slowly growing in its favor, more drastic action must be taken by all persons interested if favorable results are to be obtained at the coming session of congress.

A post card campaign along the following lines should produce results:

Let each individual retailer mail a post card daily to the congressman from his district and also one to his senator. On this card let there be some pertinent reason given why the Stevens bill should become a law. Every wholesale house, every manufacturer, every retailer, every organization of wholesalers, of manufacturers, of retailers and of clerks should do likewise.

The cost of such a plan to any one concern or individual would be but two cents per day. Cards could be sent for one hundred days at a cost of but two dollars.

Suppose this plan was adopted by individuals and organizations all over the United States and the campaign carried on for one hundred days. What effect would it have on the lawmakers at Washington? Imagine thousands of cards pouring into the capital daily; hundreds to each congressman and senator. Could they well afford to overlook the demands made?

Every merchant can give a hundred reasons why the Stevens bill should become a law. For the purpose of the above campaign these should be presented in a concise, snappy and to-the-point form. No stereotyped rules should be followed, but rather an endeavor should be made to instill a personal note into each communication.

The plant of D. F. Campbell Builders' Supplies and Construction Co., Wilmington, Del., was recently damaged in one of the largest conflagrations experienced in that city for many years.

NEW INCORPORATIONS AND VENTURES.

The Sheesley Supply Co., Inc., Johnstown, Pa.; capital, \$50,000; incorporators, M. M. Sheesley, Fred K. Sheesley, J. D. Sheesley and F. M. Sheesley, all of Johnstown, Pa., and Horace A. Sheesley, Sebago Lake, Maine.

H. B. Hartman Co., McKeesport, Pa.; to engage in the builders' supply business; incorporators, Harry B. and John H. Hartman and John N. Hartman, Jr.

The Menomonie Fuel & Supply Co., Menomonie, Wis.; capital, \$20,000; incorporators, Frank S. Peck, R. E. Bundy and Grace Myers.

The Stockton Builders' Supply Co., Stockton, Cal., has been incorporated.

R. B. Glaubitz, engaged for the past thirty years in the lumber and building material business at Wittenberg, Wis., has sold his lumber business to the Farmers' Building Supply Co.

The Milwaukee Building & Supply Co., Milwaukee, Wis., has increased its capital stock to \$10,000.

The retail supply business of Shreiner & Co., Lancaster, Pa., has been purchased by the B. B. Martin Co.

W. A. Spurrier, Jr., & Co. is opening a retail building material yard at Des Moines. The yard manager is Frank Ewoldt and the other officers are: W. A. Spurrier, Jr., president; B. H. Thomas, secretary; A. L. Kreidler, manager real estate sales department, and F. A. Harris, manager architectural department.

Tupman Supply Co., Anderson, Indiana. Capital, \$5,000; builders' supplies; Edgar W. Tupman and others.

NEW ORLEANS HAS FAIR DEMAND.

New Orleans, La., April 15.—Although prices on practically every material are advancing, building material men in this territory report that there is a fair demand. Although there have not been very many big structures started in the past sixty days, construction work is active on smaller projects. Renewed life has been put into the industries of New Orleans by the news that the administration has decided to retain the tariff on sugar, or, at least, to save the principal industry of Louisiana from total destruction for three years more. The renewed confidence is shown in bank deposits, which have set a record in the past two months. Before this news came in many sugar planters, facing bankruptcy, had made arrangements to sell their holdings.

Especially is construction work active on moving picture theaters. Work has commenced on a \$150,000 structure, and a second, to cost \$200,000, will be erected in the early fall, while a third will be finished within a few months. Smaller theaters are being built or projected at the rate of one or two a day. At least thirty new theaters have gone up since the first of the year, and more are contemplated for the summer months.

HENRY A. LENSING PASSES AWAY.

Henry A. Lensing, president of Lensing Bros., Inc., Evansville, Ind., died on Tuesday, March 28, at his home in that city. He had been engaged in the builders' supply business for a number of years, and, due to his pleasing personality and his conception of the rights of others, he had a host of friends in the trade, not only in his city but throughout the entire state of Indiana and many sections of the United States. He was personally acquainted with the ROCK PRODUCTS AND BUILDING MATERIALS staff, who sympathize with his associates and the members of the family who survive him.

BUILDERS' ASSOCIATION TO STIMULATE BUILDING.

The Builders' Association of Kansas City, Mo., is planning active work this spring along definite lines. Two subjects occupy the next two meetings—that of stimulating building while prices are still comparatively low, and that of securing a revision of the city building code and ordinances.

The first general meeting of the year, and the first of a series of group meetings planned by the association, is one in which the architects, the contractors and the material men will get together to discuss ways of stimulating building. One feature to be discussed will be publicity for the fact that steel alone has risen to any considerable degree, and that it is, in fact, a small factor in building.

"There is a general feeling that building costs are abnormally high," said J. A. G. Badorf, secretary of the association. "We hope to find a way to remove this erroneous impression."

The situation is much the same now as following the first stunning effect of the war—prices are low enough to justify investors to build, even if they have to hold their structures vacant a year or so. But the notion of "everything is high" has become so prevalent that it is said to be deterring much building.

The second item on the program, that of a new building code, will be taken up at a general meeting within a few weeks. E. L. Winn, a director of the association, will outline at this meeting the necessary steps.

UNIQUE MEETING OF RETAILERS.

A most unique meeting of retailers is scheduled for Wichita, Kans., on May 17 and 18. Wichita is the headquarters for a large number of line yard concerns. The lumbermen of the city have asked the retail dealers of Kansas and Oklahoma to a Convention and School of Business Lectures. Wichita is not the regular meeting place of a sectional convention; most of the dealers who will be present are members of the big Southwestern Association which meets every January in Kansas City. It may be that a sectional association is in the minds of some, and such an association might be a good thing. At any rate the program promises to be a good one. Some of the subjects of lectures already announced are "Credits," "Community Development," "Problems of Mail Order Competition," "Efficiency in Government," "Some Legal Problems," "The Retail Merchant and the Community." The Agricultural Department at Washington has been asked for an exhibit. Some of the ideas of the School of Business Lectures now given annually by Kansas University will be utilized. The following retail lumbermen of Wichita are the head of committees, having the arrangements in charge: F. A. Amsden, H. E. Case, Henry Comley, J. W. Metz, F. W. Oliver, T. M. Deal and J. H. Engstrom.

RETAILERS OF PASSAIC AND BERGEN COUNTIES, N. J., DINE.

The Building Material Men's Association of Passaic and Bergen counties, comprising within its membership a large majority of the building material firms of that section, held its annual banquet at the Hamilton Club, Paterson, N. J., on Tuesday, April 11, at which time about ninety representatives were present. The dinner was excellent and the general program of the evening thoroughly enjoyed by all. There were no set speeches, but following the dinner an excellent vaudeville and general entertainment was provided. This organization, supplementing the parent state association in the same line, is doing a valuable work for its members along the line of trade betterment.

C. J. CURTIN HEADS NEW YORK EXCHANGE.

At the thirty-fifth annual election of the Building Material Exchange of New York City and vicinity held in the Woolworth building on April 10, C. J. Curtin, president and owner of the Farnam Cheshire Lime Co., was chosen president and Elliot Smith, of Candee, Smith & Howland, was made vice-president. Both men have been active workers in the Building Material Exchange for years and have mapped out an aggressive program for the coming year, looking toward larger membership.

William C. Morton was re-elected treasurer for the eighth consecutive term. His report showed the exchange to be in a strong financial condition. The remainder of the regular ticket was elected as follows: Trustees, George A. Molitor, secretary; William H. Barnes, Jr., William T. Roberts, John W. Ruth, E. B. Page, Thomas I. Gleason, Walter C. Schultz, Lawrence Pritchard, Frank E. Wise, and Harold Halstead. The inspectors of election were Orin F. Perry, Ernest Braun and H. P. Brown.

There was a movement on foot to have the exchange moved into a place in the Wall street finan-



C. J. CURTIN, PRESIDENT.
New York Building Material Exchange

cial district, but a counter movement was made to move it into the new building material zone uptown. A compromise was effected whereby the exchange will renew its present quarters in the Woolworth building.

SPRINGFIELD, MO., HAS NEW EXCHANGE.

A new builders' exchange has been organized in Springfield, Mo., with permanent offices in the Woodruff Building. The objects of the organization are to promote and protect the interests of its members; to maintain just and equitable treatment in their relations with each other and with their employees; to promote the steadiness of employment in the building trades; to promote and facilitate the settlement of labor disputes; to prevent strikes; to encourage the formation of associations of contractors; to promote and protect the business interests of its members and its affiliated associations; to provide proper means of furthering the educational, social and fraternal interests of its members and of the building trades generally, and to protect and enhance the industrial and commercial interests of Springfield and vicinity. The officers for the ensuing year are: President, A. H. Walker; vice-president, W. H. Kilbuck; treasurer, Lee Savage, and secretary, W. H. Ipsen.

NEW ORLEANS EXCHANGE REARRANGES QUARTERS.

Complete reorganization of the three floors of the New Orleans Contractors' and Dealers' Exchange was decided on at a meeting early in April. A proposal from J. W. Thompson, the prominent contractor, for renting the entire first floor of the exchange, was received and accepted. R. A. Thompson, representing the J. W. Thompson Co., closed a five-year lease with President H. H. Thomas, and the first floor of the exchange will be transformed into elaborate general offices and display rooms for the J. W. Thompson Co. Mr. Thompson's move will cause a general shifting at the exchange. The second floor of the building will be altered and remodeled to suit tenants.

On the third floor of the building, which contains the quarters of President Thomas and Secretary McChesney, and which has always been devoted to members of the exchange, other changes will take place. The general meeting room will be made more attractive by the addition of a complete library, which will contain all the trade journals, daily and weekly newspapers, bulletins, etc. There will be private rooms for figuring plans, making up payrolls, etc., and several committee rooms.

CONDITIONS IN WESTERN CANADA.

Winnipeg, Man., April 15.—Conditions in the building and allied industries in Western Canada have been picking up well during the last few weeks. All the snow has disappeared and the roads in the country are in fairly good shape. This has stimulated the amount of country building during the month. In Saskatoon, Sask., dealers say that they have done more estimating on orders since January this year than they have during all 1915. Most of this is for farm building materials. The farmers this year are erecting a much better class of house and farm building than hitherto, and builders' supply dealers throughout Saskatchewan, Alberta and Manitoba are expecting a large increase in the volume of their sales during the coming summer.

EASTERN CANADA BUILDING REMAINS QUIET.

Toronto, Can., April 18.—Business, with the exception of building, continues to exceed in volume the corresponding period of a year ago. Bank earnings show an increase of twenty-five per cent. Railway earnings are considerably ahead of last year. The trade figures are correspondingly satisfactory. There is no sign of any change in the building situation, however. Forty-three cities report permits for less than \$2,000,000, a sum that will hardly cover wear and tear. There are some large buildings for Toronto under construction or contemplated which, if they go ahead this year, will greatly increase the amount credited to this city.

Some of the dealers, when consulted in regard to the situation, stated that they were doing most of their business in the smaller places where the permits were not reported. The figures received show permits amounting to \$1,198,845 for twenty-nine eastern cities for March.

Dealers have pointed out that, with the possible exception of lumber, building materials have, on the whole, decreased in price. Stone has remained at a stationary figure. Imported stone costs a little more perhaps on account of the war tax amounting to about three cents per cubic foot. Brick, however, is generally quoted at a lower figure. Run of kiln, for instance, costs about \$8.00, compared with \$10.00 to \$12.00 formerly quoted. Better grades are correspondingly less. Cement is quoted at from five to ten cents less, while lime remains constant at thirty-eight cents.

NEWS of the TRADE

Tomkins' Review of Trade Conditions.

Newark, N. J., April 18.—In practically every section of the country and in almost every industry the general business activity continues, according to Ambrose Tomkins, of Tomkins Bros. There seems to be at hand the fulfillment of the promise of great improvement in the building material trades for this year. More large operations have been started and more construction contemplated and plans filed than at any time for several years past, and this in the face of higher prices for materials and labor. For this reason there seems to be some hesitancy among speculative builders and those contemplating building houses for occupancy. Regarding this phase of the situation, close observers have ventured the opinion that now is the time to build, largely for the reason that money is very plentiful and that all signs point to steady and possibly higher prices for building materials for many months to come.

The difficulty experienced by builders in getting structural steel is having its effect on the Portland cement industry. Operators are turning to reinforced concrete for more large projects than ever before. In addition, much interest in cement roads is being aroused through the national publicity campaign of the Portland Cement Association, and the prospects are for a heavy demand throughout the year.

The newspapers recently have devoted considerable space to conditions in the building material market, pointing out the rises of from twenty-five to 100 per cent in the prices of various commodities. Some of these accounts have erroneously given the impression that Portland cement has advanced about fifty per cent above normal, and that it is selling at a high figure. This is far from accurate. Cement is selling today considerably below the average for the last fifteen years, and not any higher than the average for the last ten years. In this territory it is from fifteen to fifty cents per barrel less than in the western cement districts. For the two years prior to the war the average price in the Lehigh valley district was ninety cents per barrel in bulk at the mill, with a two-cent discount for cash in ten days. The present mill price is one dollar and five cents, with a five-cent discount. It is, therefore, clear that this is an advance of only thirteen per cent instead of fifty per cent, as claimed.

In view of the foregoing, together with the increased cost of cloth bags, a sixty-five per cent rise in dynamite, higher wages, higher coal, and scarcity of machinery, it certainly looks as though Portland cement here in the east is selling at a fair price at this time; and that an advance in the near future would not be at all surprising.

Much to the surprise of the trade, the price of sewer pipe and flue linings has again advanced. The ball was started rolling on April 1 by one of the largest manufacturers. Since then, from time to time, other manufacturers have fallen into line, until at the present time prices are practically uniform. The reasons given are increased cost of labor and fuel, heavy buying in the middle west, and excellent prospective demand here in the east. At the present level, which is three points higher than prices in March, it would seem that the man-

ufacturers are getting a pretty good price for their goods.

The manufacturers of high grade calcined plaster, which is used almost exclusively for finishing purposes, are having great difficulty in securing sufficient tonnage to transport the rock from Nova Scotia and other points in Eastern Canada. Tramp steamers that prior to the war could be chartered at extremely favorable rates are now practically unobtainable at an advance of more than 100 per cent. Taking this into consideration, it would seem that the plaster manufacturers were extremely conservative in making their recent advance. When one realizes all the items and operations that are necessary to make up a barrel of plaster, it certainly seems that there is no article in the building material line that is sold at a price more favorable to the consumer than a barrel of calcined plaster.

One of the largest manufacturers of expanded metal lath reports increased sales for January, February and March, notwithstanding the fact that a great many dealers laid in rather large stocks of metal lath previous to the first of the year, before the prices were raised. Although the sheet steel market has advanced slightly for the second quarter of the year over the prices for the first quarter, the probabilities are that prices will hold steady and that there will be no further advance prior to the first of July. Beyond a doubt there will be a rise in price after that date, since it is expected that the steel companies will place a much higher price on steel sheets for the last half of the year than during the first six months.

There is every indication that the present volume of business will continue throughout the year, and if this is the case there will probably be more difficulty in getting delivery of goods later in the year than has been experienced during the first three months. The question of delivery will probably be a greater factor than that of price.

There is a very good demand for metal corner beads. Prices are fairly steady on beads manufactured from galvanized sheet. Corner beads, and in fact all kinds of metal specialties, galvanized after manufacture, are very hard to obtain and the price is very unsteady. This is due to the upward whirl of prices on zinc (spelter) used in galvanizing.

Small channel iron for use in connection with metal lathing is coming into demand and the stocks at the mills are very low. It is impossible to secure delivery in less than four or five weeks from the mills. The price is rising without any indications of its being lower in the near future.

March Building Shows Big Increase.

Building operations throughout the country continue unusually active. The official figures of building, secretary and General Manager J. M. Sholl, of the American Contractor, Chicago, total \$84,284,464, as compared with \$71,342,907, for March last year, an increase of eighteen per cent. A majority of the list, or sixty-four, shows gains in the comparative statement; forty-nine make unfavorable comparisons, but the latter almost entirely among the smaller cities. The present building activities are the more pronounced among the larger types of structures. This is further shown by the fact that while there is a gain of eighteen per cent in the totals, the actual number of permits issued decrease

from 28,932 in March last year to 26,218 for last month. The tendencies are thus toward the construction of better and larger structures.

New York City shows an increase of twenty-eight per cent, entirely in the boroughs of Manhattan and Queens; Chicago makes the decided gain of fifty-five per cent. Detroit is thirty per cent ahead of last year and St. Louis thirty-nine per cent. San Francisco makes the rather surprising increase of seventy-nine per cent, considering the tremendous building era just preceding the fair. Other gains in excess of 100 per cent for the month include: Washington, 121; Norfolk, 606; Worcester, 121; Springfield, Ill., 654; Grand Rapids, 137; Richmond, 108; Sioux City, 229; Canton, 180; Dallas, 207; Des Moines, 235; Denver, 113; Dayton, 217; Niagara Falls, 704; Spokane, 140; St. Joseph, 320; San Diego, 115; San Antonio, 109; Chattanooga, 350; Pasadena, 121; Wichita, 423; Holyoke, 382; Montgomery, 307; Pueblo, 384.

The statements of the building permits issued for the first three months of 1916 total \$189,301,059, as compared with \$153,848,381 for the same period last year, an increase of twenty-four per cent. The March statement follows:

Cities.	No. bldgs.	Estimated cost.	No. bldgs.	Estimated cost.	Per Cent Gain Loss.
Albany	215	129,715	225	127,405	42
Allentown	20	160,510	20	127,780	21
Altoona	31	11,598	31	12,525	81
Atlanta	246	458,491	272	267,217	71
Baltimore	290	1,385,111	612	852,701	45
Boston	52	12,440	13	29,247	7
Bryn Mawr	107	160,000	200	135,500	7
Burlington	425	158,426	201	124,555	22
Cincinnati	257	719,939	177	454,874	33
Cleveland	2,387	3,987,000	467	1,824,000	180
Columbus	20	44,255	60	189,250	76
Dallas	207	892,000	20	800,000	90
Dayton	21	114,710	131	7,402,750	23
Denver	1,106	1,125,461	1,006	1,023,015	28
Des Moines	46	96,000	83	162,000	58
Detroit	1,465	3,554,124	863	3,554,124	69
Evansville	1,123	1,225,461	1,483	1,023,015	28
Grand Rapids	112	37,417	70	12,750	137
Hartford	121	382,952	73	135,950	61
Houston	240	452,891	19	250,120	46
Indianapolis	94	686,120	161	708,237	46
Keokuk	115	2,540,240	80	47,450	97
Kansas City, Mo.	32	6,000	16	47,450	57
Los Angeles	94	406,144	74	118,245	235
Louisville	915	2,817,364	532	1,399,125	49
Madison	30	60,010	70	56,125	21
Manitowish	30	30,722	30	30,722	0
Memphis	24	119,725	36	36,025	25
Meriden	24	119,725	36	36,025	25
Minneapolis	186	129,490	149	405,227	43
Montclair	53	115,450	53	115,450	0
Montgomery	32	262,952	70	165,500	61
Muskegon	112	617,000	70	250,120	137
Nashville	32	1,340,000	104	708,237	46
New Bedford	94	6,000	16	47,450	73
New Haven	115	115,450	20	24,775	262
New Orleans	34	62,972	74	390,400	79
New York	74	304,200	74	299,000	2
Norfolk	41	60,000	20	269,500	85
Omaha	69	55,400	60	185,385	67
Orlando	1,778,819	1,778,819	34	87,400	45
Philadelphia	59	350,485	34	268,880	6
Pittsburgh	70	1,152,400	45	87,400	45
Portland, Me.	715	2,115,635	819	1,324,856	38
Portland, Ore.	304	578,730	304	578,730	0
Rochester	304	578,730	304	578,730	0
San Antonio	47	305,000	259	345,785	27
San Diego	200	390,000	259	345,785	27
San Francisco	490	1,700,000	490	1,700,000	0
Seattle	61	61,700	49	100,325	38
Shanghai	39	47,450	39	47,450	0
Shreveport	413	323,844	362	100,570	80
Sioux City	43	400,000	43	400,000	0
Spokane	20	400,000	20	400,000	0
St. Louis	183	1,152,400	195	835,470	27
St. Paul	2,051	15,000,000	2,051	14,000,000	23
St. Petersburg	274	5,350,420	285	4,965,280	14
St. Thomas	29	2,555,400	12	181,250	94
St. Vincent	4,350,128	1,186	4,299,300	41	
Springfield	736	2,117,144	682	2,117,144	8
Springfield, Mass.	1,192	2,117,144	682	2,117,144	8
St. Joseph	221	703,700	216	613,720	12
St. Louis	12	209,062	12	209,062	0
St. Paul	62	1,176,139	67	180,824	704
St. Petersburg	245	310,580	316	500,775	82
St. Thomas	142	248,502	94	332,860	4
St. Vincent	136	175,132	146	79,773	121
St. Paul	22	62,100	29	288,360	24
St. Petersburg	41	131,170	39	159,175	6
St. Thomas	41	131,170	39	159,175	6
St. Vincent	41	131,170	39	159,175	6
St. Paul	41	131,170	39	159,175	6
St. Petersburg	41	131,170	39	159,175	6
St. Thomas	41	131,170	39	159,175	6
St. Vincent	41	131,170	39	159,175	6
St. Paul	41	131,170	39	159,175	6
St. Petersburg	41	131,170	39	159,175	6
St. Thomas	41	131,170	39	159,175	6
St. Vincent	41	131,170	39	159,175	6
St. Paul	41	131,170	39	159,175	6
St. Petersburg	41	131,170	39	159,175	6
St. Thomas	41	131,170	39	159,175	6
St. Vincent	41	131,170	39	159,175	6
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St. Vincent	41	131,170	39	159,175	6
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St. Vincent	41	131,170	39	159,175	6
St. Paul	41	131,170	39	159,175	6
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CHICAGO RETAILERS BUSY.

Retailers of building materials in Chicago and adjacent suburbs are busy filling orders on structures to be completed before the May renting season. The price of materials show an increase of from five to fifteen per cent over the spring period of 1914. Despite this advance, the demand is good.

Manufacturers of common brick are exceptionally busy and orders on hand indicate an unusually active season. William Schlake, president of the Illinois Brick Co., says: "Business this year has been considerably better than for some time. During the first quarter we delivered approximately 100,000,000 brick in this territory, which is the best first quarter for years. Between 700,000,000 and 900,000,000 brick are used in this section in a year and we have an unusually good start. Prices are uniform with those of last year, common brick selling at \$7.00 a thousand and select and sewer brick at \$8.00. All yards and factories are reporting an extraordinary demand and while we are working at full capacity, supplies are rather low. Orders are beginning to pile up; in fact, we are receiving more orders every day than we can supply in that day. We have more unfilled orders than for some time. On the whole, conditions in the brick field are in an excellent shape and we look for what will be the best season in several years."

Face brick dealers are receiving numerous inquiries and some orders are being booked. Activities in this particular field are expected to reach a high level during the next few months.

While numerous permits are being issued by the city building department, there are no skyscrapers or large business structures planned for immediate construction. The bulk of permits is for apartment houses, which are ranging in size from the smaller structures built to accommodate two, three or four families to buildings as large as five stories and containing ninety-six apartments. The latest venture in this line is now being planned by Charles F. Henry, who is planning the construction of a high-grade fireproof building of five stories to cover a space of 150 by 100 feet at the southeast corner of Greenview and Birchwood avenues. The structure will contain ninety-six apartments of one, two, three and four rooms. There will be three stores on the ground floor with a main cafe, billiard hall and ladies' waiting room. Architect Roy France has designed the building, which is expected to cost \$230,000.

G. C. Nimmons, architect, has designed a five-story brick addition to the plant of Sears, Roebuck & Co., which will be erected at an approximate cost of \$240,000.

Retail coal dealers of Chicago announce that the unsettled labor conditions, increases in the cost of explosives brought on by the large demand made by the European war and an advance of twenty-five cents per ton in freight rates will necessitate a raise in price of from 10 to fifty cents a ton to the consumer for both domestic and steam fuel. Usually at this season of the year the price of anthracite coal drops fifty cents a ton and residence and apartment owners order their supply to be delivered at the convenience of the coal dealers. This reduction in price has not taken place this year and as a result few of the yearly contracts are being received. From present indications, it looks as though this regular spring demand will be postponed until the first cold days of fall, when an unprecedented demand is anticipated. What effect this will have upon the coal market can only be conjectured at this time, but developments will be watched with a great deal of interest.

GARY, IND., TEN YEARS OLD.

Gary, Ind., April 18.—Today Gary is celebrating her tenth anniversary. On April 18, 1906, the unloading of a car of cinders under the supervision of former Mayor A. F. Knotts of Hammond, then

the steel corporation's property agent, and his brother, Thomas E. Knotts, later mayor of the city, marked the beginning of operations here. The end of the tenth year finds Gary with a population of 45,000 and new construction under way that exceeds in magnitude the original project. In June, when the Indiana centennial will be observed here, citizens of Gary will formally observe their decennial.

K. C. BUILDING REPORTS SHOW GAIN.

Kansas City, Mo., April 18.—Building permits issued by the building department of Kansas City during the month of March show a fine increase over the previous month and over the same month a year ago. Three hundred and forty-four permits were issued with a valuation of \$1,226,619. During the same month a year ago 314 permits valued at \$848,595 were issued, showing an increase of 44.53 per cent for 1916. A comparison for the first three months of the year for the past three years is interesting. In January, February and March, 1914, 841 permits valued at \$3,454,595 were issued; the same months of 1915, 671 permits valued at \$2,132,805; and the same three months of 1916, 649 permits valued at \$2,135,864.

The present outlook is that Kansas City is to have a new postoffice. The Public Building bill probably will contain authorization of one million dollars for a site near the new Union Station and two millions for a new building.

Kansas City bond issues totalling over \$4,000,000, which have been held up since their acceptance by the city last June because of a factional row in the ranks of the party in power, will go through in the near future.

EVANSVILLE LOOKS FOR ACTIVE SPRING.

Evansville, Ind., April 15.—The building material people here look to see the remainder of the spring active. A snow fell here last Saturday and the winter has been prolonged by much bad weather. Work is in progress on the big Coliseum, a public auditorium. The Evansville Builders' Exchange is doing good work, headed by Albert F. Caden, of the Caden Stone Co., as president. Permanent quarters are maintained downtown, with a young lady secretary in charge.

Lensing Brock, Inc., the Indiana Builders' Supply Co. and the Caden Stone Co. all report good spring prospects. Mr. Lensing said that the cement and lime market both were tending upward here, with a good trade on roofing, plaster, sand, etc.

MEMPHIS MARKET STRONGER.

Memphis, Tenn., April 18.—The material market here is a little stronger and more active than a fortnight ago. This applies to cement, lime and other articles. Roofing and specialties are stronger, too.

J. A. Denie & Sons Co. said today: "Business is better, the price undertone is stronger. Warm weather and building are the order."

MINNEAPOLIS BUILDING ON INCREASE.

Building permits issued by the city of Minneapolis for the month of March shows a considerable gain over the preceding months of the year and excels the record of March, 1916, by \$14,335. The number of permits issued during the month was 460 at a total cost of \$1,386,805.

New Orleans, Shreveport, Bogalusa and other points in Louisiana are receiving many calls for lumber and other building materials from Paris, Texas, which is on an unprecedented building boom to replace about half of the town recently destroyed by fire.

BUILDING ACTIVE IN CINCINNATI.

Cincinnati, O., April 19.—Building activity is steadily increasing in and around Cincinnati, and prospects continue to brighten, giving every indication that the current season will be one of the best which has been experienced in several years. The outstanding feature of the season so far is the number of residences planned and under way, while, on the other hand, there is also an ample amount of industrial and business construction going on. While material men are hampered to some extent by the difficulty experienced in moving cars, stocks are good, as a rule, and so far deliveries are being made on time.

The Cincinnati Clay Products & Supply Co. is making deliveries on several good-sized jobs, including face brick on a handsome apartment building on Madison Road, and the company is also making active preparations to start brick moving on the big high school job further out on the same street. The Ferro-Concrete Construction Co., which has the general contract on the job, has constructed a siding from the Norfolk & Western to the site, and the brick, as well as other material, will be moved directly to the spot over this siding, making a substantial saving possible on the item of haulage.

The Moores-Coney Co. has taken over the building supply end of the business of the Reliance Coal & Coke Co., established about six months ago. The Reliance company, which is controlled by the Fleischmann interests, has a large coal business, and this addition of a building supply department was an experiment in line with similar efforts on the part of a good many coal companies. The Moores-Coney Co. takes over all of the stock on hand, and will also assume the contracts of the other company in that department.

The Shorey-Willis Brick & Supply Co. reports great activity in its common brick department, and it is now engaged in filling contracts of some size at various points, including 100,000 for a school at Somerville, O., 300,000 for the Middletown, O., post office. In fact, according to Mr. Willis, the company is oversold on common, and in order to make deliveries and take advantage of the active demand for the brick, has taken over the plant of the Williamsburg Brick & Tile Co., of Williamsburg, O. The plant has a capacity of 25,000 hollow brick a day, and this will be increased to at least 30,000. The plant will be operated by a new company, known as the Williamsburg Brick Co., and controlled by the Cincinnati concern.

PITTSBURGH BUILDING IS SPOTTED.

Pittsburgh, Pa., April 18.—Building in the Pittsburgh district is not progressing as well as contractors and dealers would like to see it. In fact, the situation is very spotted. Some parts of the city show a notable amount of house building this month. In other sections there is very little doing. In the South Hills district, especially Dormont and Brookline, there is more building than for several years. The Squirrel Hill district of the East End is also the place where many contracts are being let for good houses. On the north side very little building is in evidence, especially house building. The same is true of most sections of the East End. The surrounding boroughs and towns are doing much better than the city itself and from this source there is going to be a very good total of building reported this spring. All the industrial and mining towns in Tri-State territory are doing considerable in the way of providing more houses for employees, as a distinct shortage of dwellings for workmen is reported in all parts of this district. Large building is confined chiefly to public building projects such as churches, school houses, city and county work, and to the building of new manufacturing plants or extensions to old plants and factories. There are a large number of warehouses also under construction.

CONCRETE

Permanent Sepulcher Made Universally Available

In all the development of new and greater uses of concrete none perhaps will meet with prompter recognition of its value and be so readily adopted in general use than that relating to the more sanitary disposal of the dead. It has fallen to our lot to encourage, aid and assist, in so far as we have been able with our already overworked force, to bring about the basically correct application of concrete in connection with the burial of the dead.

There have been a number of false starts made, methods that can have only a limited application, and others too expensive to be considered. The individual outer box for the burial casket scarcely an inch and a half thick that has been exhibited for several years, and used to a certain extent, lacked the appeal of solidity and stability and is entirely too costly for the purpose. The small amount of concrete contained in these outer boxes or burial vaults, as they have been called, is enough to condemn them as a concrete product for such a subterranean use, and their principal safety perhaps lies in the fact that they are always covered up in the ground never to be removed, so that nobody ever knows whether they have failed or not. No matter if a large number of exhumations should demonstrate that these thin concrete boxes have answered the requirements for a few years, it is reasonable to calculate that no such structure could stand much of a shock, as of an earthquake, for instance, or any other serious disturbance.

All that such a vault could ever accomplish can be much better provided in concrete at less than half the cost, as has been explained to numerous cemetery superintendents having charge of interments when more than ordinary safeguards are required, about as follows:

The grave is dug the same as for an ordinary interment, except a foot longer, a foot wider and six inches deeper. An hour or more previous to the interment a concrete floor is poured into the excavation, smoothing the upper surface to approximately six inches thick and about level. At the time of the interment have ready a mortar box holding one yard and a half of ready-mixed concrete to pour into the excavation as soon as the wooden box containing the casket is deposited upon the floor, which by this time has reached the stage of initial set of the cement, so that it will readily bind firmly to the new wet material. It is the work of a moment to strike off the surface to an approximate level and lay rough boards over the surface. Now the load of four feet of freshly shoveled earth comes on top of the boards, so squeezing the flowing concrete firmly into its final position.

This produces a monolithic concrete box six to eight inches thick and amounts to hermetically sealing the casket within a solid stone boulder firmly planted with perfect bearings all around.

Such a burial requires about two cubic yards of concrete. It can be done in any cemetery by a local concreteman or by the superintendent with his regular help. Twenty dollars as an average will cover the cost which will yield a very good margin of profit upon the concrete part of the operation.

This is less than half the average cost of the fabricated box, and it is easy enough to see that it is far superior from every engineering, sanitary and practical standpoint. In all cases of interments of contagious subjects this method should be made legally obligatory and those officials having charge of public health should be made to know of the universal availability of such a high-

grade method for permanently hermetically sealing these subjects at insignificant cost.

The private mausoleum has for ages been considered the most dignified method for providing the burial receptacle for family use, consisting of a number of individuals. Such structures are extremely difficult to construct, owing to the fact that it is a building which must be so designed as to take care of itself, since the occupants are in no position to look after it and time very soon wipes out the nearest of kin who might be interested in its preservation. So costly are well-built and properly designed mausoleums that only the very rich can entertain the idea of indulging in such a luxury.

Again is concrete introduced as the structural material to bring about a tremendous improvement in providing a family sepulcher which far exceeds



LONGITUDINAL SECTION, SHOWING INTERIOR OF MEMORIAL AND CASKET RECEIVING COMPARTMENT. ARROW INDICATES COPPER LINING.

anything else for the same purpose that has ever been devised. It consists of an underground chamber built with heavy concrete walls and of the proper size to receive the burial caskets. It is just as proof against earthquakes as it is against the ordinary destroying elements of frost, lightning and tornadoes. The size of the sepulcher is determined by the number of interments that are intended, provision being made for encasing each one of the caskets in concrete so that when the sepulcher is filled it becomes a veritable concrete caisson or bell, with concrete bridge walls spanning the interior both horizontally and vertically, thus making such a sepulcher 100 per cent permanent, both as to the form and material insofar as the knowledge of modern engineering knows anything of permanence.

The bottom and walls of the sepulcher in principle are the same as that of the construction of a cistern, except that it is recommended that the concrete walls be at least two feet thick, carefully mixed, thoroughly tamped and waterproofed.

The method of encasing the caskets in concrete consists of merely placing the casket in position and having a form-board that extends the length of

the interior and of such a height when placed on edge that it will extend eight inches higher than the top of the casket. Then approximately one yard and a half of concrete is poured around and over the casket and struck off with a trowel even with the form-board. A second interment alongside of the first will not require the form-board, the casket being merely placed in position and the concrete wall of the former interment makes the form. This operation is repeated until the sepulcher is filled, when the entrance door can be removed and the opening so left filled up with concrete. In this way for all time the sepulcher becomes a solid boulder embedded in the earth with perfect bearing all around. Nothing could be imagined more permanent, or more desirable in every way, and it is by no means an expensive method of burial. It is of equal, universal application as is the individual monolith of concrete described above.

This type of family burial vault has been under development for several years, and very recently has been made available through the regular retail channels of the monument trade by the Memorials Art Co., of Buffalo, N. Y., who have perfected the memorial features for all such sepulchers by the most dignified, attractive and modern equipment to appeal to people of the best taste.

The superstructure or memorial rests upon and becomes the visible finish of the sepulcher. They have designed it so that all the working parts, such as the lowering device, the doors and ornamental metal finish are of Gorham bronze, the United States standard alloy for that metal, and the construction of the memorial above ground may be of the richest granite and marble in a style of finish to suit the taste of the purse of the purchaser.

In the accompany illustrations the designers have recommended a copper casing or imbedded lining in the concrete, as a further insurance against water damage from without, which in some localities is a very difficult problem.

Such a combination of visible memorial and permanent sepulcher for the dead has been made available in every American cemetery, and constitutes a very great and important addition to the uses of concrete.

When one takes into consideration that there are no less than 20,000,000 families in the United States, every one of which is sure at some time to need just such a sepulcher, it will be recognized that this new use for concrete is one of very large proportions, and worthy of the attention of all who are interested in the development of concrete. Further, the improvement is well worth all its costs, and really introduces great economy with the improvement.

NEW CONCRETE PLANT FOR LEXINGTON.

At Lexington, Ky., the F. T. Justice Co., which works largely in concrete, has purchased eleven and one-half acres on the C. & O., and will immediately erect a modern plant which will include five buildings and an overhead system of trackage for unloading sand, gravel, etc., into concrete bins, while the whole of the area which will be used actively in handling the business will be concreted. The company will continue operations at its Main street location until the new plant is finished. Recently the Congleton Construction Co. purchased a site near that bought by the Justice company and is now constructing a plant for its operations.

Representatives of the Dewey, Iola, Kansas City and Western States Portland cement companies, Koehring, Lansing, Milwaukee and Smith concrete companies met at a luncheon in Kansas City on April 6 for the purpose of discussing the development of a permanent organization of cement users and the holding of an annual cement show. The conference resulted in the appointment of a committee to study plans of procedure and report at a later meeting.

SAY WICCAPEE!

It Has Stood the
Test of Time

New York Rubber Co.

(INC. 1851)

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FACTORIES:
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The Cost of Changing Cable

Every time you install a new rope, you are spending time and labor, and your work stops. Did you ever figure out just what this time, labor and delay actually cost in dollars and cents?

Whatever the cost is, it must be added to the original price of the rope in order to determine correctly the rope's value.



Reg. U. S. Pat. Off.

is made to give maximum service, rather than to sell for a minimum price.

Because of its durability it saves the expense of frequent changes, and consequently it is more economical in the end than a "cheap" rope.

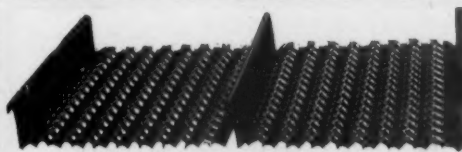
Why not make the saving?

59 years in business

A. Leschen & Sons Rope Co.

St. Louis, U. S. A.

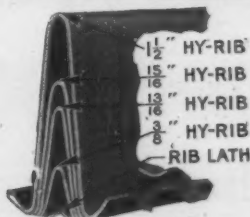
New York Chicago Denver Salt Lake City San Francisco



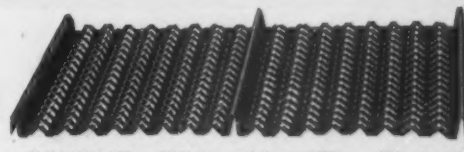
1 1/4" Hy-Rib—Very rigid. For heavy loads and wide spans



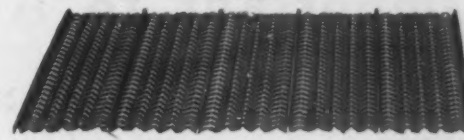
15/16" Hy-Rib for floors and roofs without forms—sidings, partitions, and ceilings without channels



IT'S THE STRENGTH
OF THE RIBS
THAT COUNTS
HY-RIB
AND



13/16" Hy-Rib. Widely used in partitions, sidings and ceilings



3/4" Hy-Rib Lath used as a self-furring partitions, ceilings, etc., for stud spacings 24 to 36 inches

The Complete Line of Best Products

embodies everything that is best in their particular field. To buy from the complete line assures your satisfaction from every standpoint.

Hy-Rib in four depths from 3/4" to 1 1/4". Each in various gauges.

Rib Lath, a most economical lath in three types and various gauges.

Diamond Lath in two types and various gauges.

Kahn Pressed Steel Studs include channels from 3/4" to 2" in size, studs with prongs from 2" to 12" and hollow studs in various sizes.

Steel Corner Beads for the protection of plastered corners, in four types.

Metal Base Screeds for use between cement base and plaster are supplied in three types.

Inserts for use in concrete slabs, beams or columns, for attaching fixtures, Shaft Hangers, etc., are furnished in three types.

You save money by using a line that is known for its high quality and the service back of it.

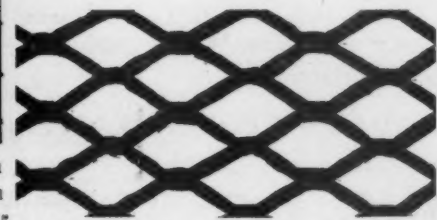
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Dept. H 26 Youngstown, Ohio
Representatives in Principal Cities



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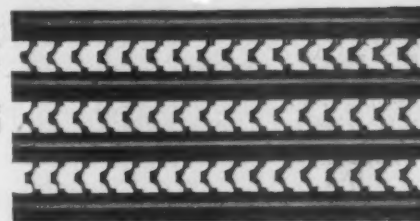


Kahn
Pressed
Steel
Channel
Studs,
2", 3", 4",
5", 6"

Diamond lath of two types and various gauges

KAHN
Building
Products

TRUSSED
CONCRETE
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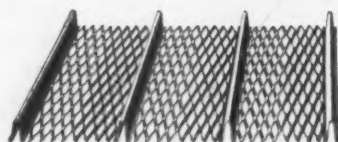


Beaded Plate Rib Lath permits two-coat work instead of three



Kahn
Pressed
Steel
Channels,
3/4", 1",
1 1/2", 2"

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Self-Sentering

for roofs, floors, partitions and walls. A combined form and reinforcement, a lath and stud in one—eliminates the form work from concrete construction.

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GF Steel-Tile

for floors and roofs. Removable or permanent forms set on simple lines of shoring instead of forms. Less material, lighter weights, no leakage—good for any load and spans to 30 feet.



Herringbone Metal Lath

The stiffest, most economical metal lath made. Will not sag between 16 to 20 inches stud spacing, goes up with the minimum laps, curls the plaster into a solid key without waste. For walls, ceilings and exteriors.

A Complete Line of Building Materials and Waterproofings

DEALERS who sell the big GF Line have at their disposal high-grade building products and waterproofings for the greater part of every building operation.

More than that—they have the help of a large organization working with them in every way. Our plan is to help the dealer in his selling.

If you're interested in a GF Dealership, write and we will send you full details covering the complete GF Line, which includes—

Self-Sentering, Steel-Tile, Herringbone and Diamond-Rib Lath, Expanded Metal, Trussit, G-F Cold Drawn Channel Studs and Furring, Corner Bead, Wall Ties and a Complete line of Waterproofings.

The General Fireproofing Co.
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Real Advantages Check Them Up

Important to All Who Use or Buy Metal Lath



This is Sykes Expanded Cup Metal Lath

As sketch above illustrates—(1) Sykes Metal Lath is applied direct to sheathing boards over waterproof paper; (2) it insures a wall of exactly the same thickness; (3) therefore, a wall of equal expansion and contraction at every point eliminating the danger of cracking due to uneven expansion. (4) Sykes Metal Lath, being "backed up" by sheathing boards, is perfectly rigid. (5) It is easy to plaster over. (6) There is no waste mortar because every particle goes to make up the required thickness of wall.



This is Ordinary Metal Lath

Furring strips add 5 to 10 cts. a sq. yd. to cost of building wall. There is no key between Furring Strip and this lath. At the points where Furring Strips occur the plaster is, of course, much thinner than at other places; result, uneven strength and uneven expansion, liable to cause cracking in plaster. There is actually more mortar required to plaster a wall of given thickness using ordinary metal lath than is required if you use Sykes Metal Lath; simply because it requires more mortar to secure a key back of the ordinary lath than is necessary for Sykes Metal Lath.

SYKES METAL LATH IS BEST FOR STUCCO, FOR OVERCOATING AND FOR INTERIOR PLASTERING

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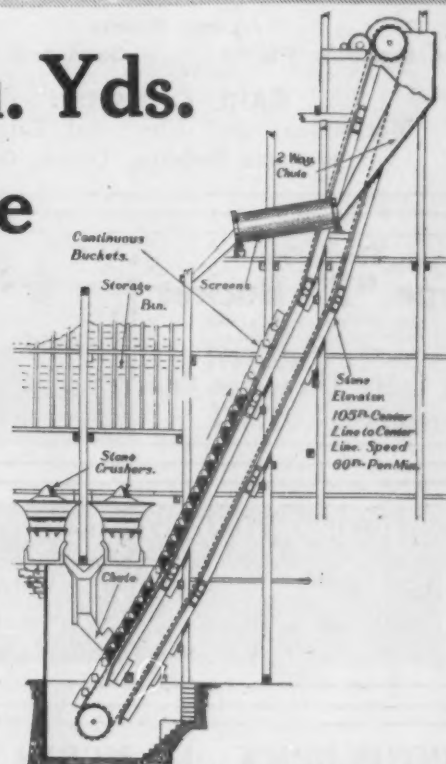
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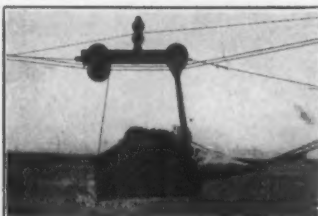
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VICTORIA BREAKWATER SHOWS UP WELL.

Victoria, B. C., April 15.—The large work of constructing the reinforced concrete breakwater at Victoria is now well under way. Although no new records were established during last month, steady progress was maintained according to statistics compiled by the supervising engineers. Now, that the weather conditions are more settled, the contractors are satisfied that the work will proceed at a more rapid rate than has been the case during the winter months.

For the greater part of its entire length, the breakwater looms up well above the water-line, presenting a solid buttress of stone and concrete for over two-thirds of its length to seaward. The contractors are now concentrating operations at the extreme shoulder of the main arm, where divers are engaged in placing the huge granite blocks and levelling off the foundations at the commencement of the extreme arm of the seawall. As the work proceeds the operations are necessarily carried on at a lower level. Thousands of tons of coarse rubble continue to be deposited to form the foundations of the extreme arm, and as it reaches the desired level it is surfaced off for the reception of the granite.

It is interesting to note that since the contract was started no less than 1,082,800 tons of rubble has been dumped for the breakwater foundations. This tremendous amount of foundation includes 242,000 tons of what is technically known as "core."

There has also been placed to date a total of 108,900 tons of granite blocks, while 23,900 cubic yards of concrete, forming the superstructure, have been poured.

During last month, 22,300 tons of rubble were dumped; 7,700 tons of granite blocks were set in place and 1,700 cubic yards of concrete poured, making five blocks.

LOUISVILLE CONCRETE WORKERS BUSY.

Louisville, Ky., April 19.—Activity has begun on a generous scale in the concreting circles and the demand for materials is brisk. The building inspector's report for the city of Louisville continues to show increases, while there is a large amount of building in prospect which will be contracted for later. Concrete sidewalk construction will be more general than for some years, it is reported, and all over the state plans have been made and contracts are being advertised for. Cloverport, Ky., on the H. & St. L., is to have a new concrete freight depot.

Considerable interest has been taken in Louisville in the claim of the city administration that it is building concrete sidewalks at a lower cost than was the case under previous administrations. Six and seven years ago the cost averaged 99½ cents a square yard; for the next four later years the cost averaged 87¼ cents, while the last two lettings were on the basis of 77 and 71 cents a square yard. That this reduction should have been made in the face of cost increases is explained by the fact that the board of public works has adopted a policy of grouping the work into batches which can be taken by contractors at lower figures than they can undertake small isolated construction jobs.

Contractors and master builders of Louisville have begun organization, under the name of The Master Builders, incorporated. It is the purpose of the organization to gather all the contractors and master builders of the city for the purpose of creating and cementing cordial and friendly relations. A department will be provided to take up and arbitrate differences when they develop and other efforts will be made to preserve harmony in the relations between the interests. The Master Builders' corporation is authorized to acquire an indebtedness of \$5,000 and the incorporators are J. B. Ohligschlager, of the National Construction

Co.; J. F. Frey, of the Frey Planing Mill Co.; Alfred Struck, of the Alfred Struck Co.; C. A. Koerner, of Bailey & Koerner, and J. L. Young, of Young & Humphrey.

SUCCESS BUILT UPON MERIT.

An interesting letter from L. P. Gregory, of the firm of Keithley & Co., Superior, Neb., tells of the development of their extensive business. They are now dealers in cement and sand and manufacturers of cement products on a very large scale. Mr. Gregory says:

"We began our business eight years ago on the street, with shovels and a mortar box to lay concrete sidewalks. We had an awful time at first fighting brick sidewalks that were then in general use. Then we took some bridge contracts and built some road culverts and operated as general concrete contractors. Later we bought an Ideal block machine and set it up in the edge of a cornfield near town and started to make building blocks. A year later we added another machine and also a Peerless brick machine. Then we moved to the Missouri Pacific tracks on



RECLAIMING OUTFIT OF SUPERIOR SAND CO.,
SUPERIOR, NEB.

leased ground where we are now located and put in an automatic tamper and a mixer, and with this outfit we turn out regularly 600 to 800 blocks per day, and find a ready market for same, for we have always made a good block and this is now recognized by the trade. We have four railroads running out of this town and we do a considerable shipping business over all of these lines. We manufacture a full line of sills, lintels, porch columns, lawn vases, and many other things. In the contracting branch of our business we have built all kinds of buildings, the largest of which is an artificial ice plant and cold storage which contains 17,000 of our blocks.

"Early in our building material business we introduced the use of Dewey brand cement and have never since used any other. The amount of sand we used in our own operations was considerable, and about four years ago we organized the Superior Gravel & Sand Co., which is an incorporated concern that we manage and sell the output. We have a 100-foot bank of sand and gravel near a railroad and put in a twenty-car spur. We have recently erected a drag line cable that handles fifty tons of sand an hour. This is operated by an electric motor and has become a very active feature of our operations.

"We are shipping blocks as far as Abilene, Burr Oak, Hubbell, Atwood, Washington and Tobias. We are confident that we can meet competition anywhere within 100 miles of Superior and sell them a better block than they can get or make elsewhere for the same money."

CONCRETE EXPANDS MOST IN COLD MONTHS.

Measurements have been taken by the United States Bureau of Standards of the change of dimension of concrete on a test road on the bureau grounds and also on the Coleman du Pont Road at Millsboro, Del. The results thus far confirm those previously obtained by the bureau on the New Village, N. J., and Nazareth, Pa., roads—that during the winter and spring there is an expansion of the concrete caused by increase of moisture content and in the summer a marked contraction caused by loss of moisture. This is contrary to the generally accepted opinion that concrete expands most in mid-summer and least in winter.

A start has been made with the new \$6,000,000 reinforced concrete building for the T. Eaton Company, Limited, at Winnipeg. One section, which will cost \$600,000 and which will be eight stories high, will be constructed this year.

CONCRETE NOTES OF THE CONCRETE FIELD.

William Goldie, Wilkesburg, Pa., has started work on a plant at Trenton avenue and Thomas street, in that borough, to manufacture concrete blocks.

The Waynesboro Hydraulic Stone Co., Waynesboro, Pa., is arranging to change its charter somewhat so as to manufacture and lay artificial stone blocks and also to do general cement work. H. R. Baker is secretary of the company.

A concrete mixing plant is to be established at Dallas, Tex., at a cost of \$25,000. The company is to be organized for the purpose by capitalists of Pittsburgh, Pa. R. T. Stuart, Dallas, will have charge of the plant, which will have daily capacity of thirty carloads.

Plans to enlarge the Poughkeepsie Cast Stone Co., Poughkeepsie, N. Y., were formally launched at the annual meeting of the company when a resolution was adopted to issue stock during the coming year. A dividend was declared and the reports show a prosperous year, according to T. H. Seaman, the president, and R. H. Bushnell, the manager. It has been the policy of the company to take no work outside of Poughkeepsie, but with the increasing demand for their material, which consists of high-grade cast stone trim, they have decided to equip the plant and increase the floor space to handle the largest jobs.

Three eminent engineers have been appointed by the Greater Winnipeg Water Board to investigate the conditions which have arisen with regard to the cracks in the huge concrete aqueduct which is part of the new \$13,500,000 water scheme, of Winnipeg, Can. Late City Engineer Co. Rutman, J. G. Sullivan, chief engineer for the Canadian Pacific Railway at Winnipeg, and R. S. Lea are the engineers appointed to sift the charges laid that the designs did not allow the concrete aqueduct to be built on the soil encountered. Work on this scheme will, it is anticipated, start again on May 1.

The Ferro Concrete Construction Co., of Ohio, with a capital stock of \$213,600 and interests of \$40,000 in Wisconsin, has filed a statement to transact business in the Badger state.

Frank Spencer, of Louisville, owner of a process for manufacturing building materials of cement, and Charles Dalton, of Louisville, formerly of Paducah, are going to establish a concrete products plant in Paducah, Ky., at a cost of \$50,000. Preliminary arrangements have been completed.

The plans for the Anderson-Cottonwood Irrigation System, in Shasta county, Cal., now being figured on call for a 2400-foot concrete lined tunnel. The tunnel will be nine feet square.

The Pittsburgh Engineering & Construction Co., Pittsburgh, Pa., reports very little doing in the actual letting of contracts for reinforced concrete and cement work at present. There is a large amount of work soon to come on to the boards, especially for concrete arches and abutments and for mill foundations. The labor situation and the general high prices are given as reasons why this work has not been let before.

The Sharon Hydraulic Stone Co., Sharon, Pa.; capital, \$10,000; to manufacture blocks, foundations and buildings of concrete and slag reinforced with iron; incorporators, William H. Garner, George W. Godfrey and Melvin W. Godfrey.

The Finesco Co., Elkton, Md.; to manufacture building material, known as "Finesco" cement; capital, \$30,000; incorporators, Herbert E. Latter, Norman P. Coffin, Wilmington, Del.; Clement M. Egner.

The John Wittel Artificial Stone Co., Irvington, N. J.; to manufacture artificial stone; capital, \$125,000; incorporators, Herman A. Wittel, Irvington; Helena Trunk, Jacob A. Widman, Newark.

CEMENT

Development of the Potash By-Product.

Ever since the war conditions started in Europe the importation of potash salts from the German sources of supply has been cut off and considerable interest has been given to the matter of discovering or developing a domestic supply of this very essential material. Very large quantities of potash have been imported for agricultural purposes, and potash salts of the various acid characteristics are indispensable to chemists and apothecaries. Importing and wholesale druggists for more than a year have been unable to supply even such quantities of potash salts as are needed by the apothecaries in connection with medical prescriptions and remedial compounds of various kinds. Such a volume as that required for agricultural purposes has simply gone by default with little consideration.

The field corps of the United States Geological Survey have scoured the country for natural deposits of potash bearing rocks and minerals. A very practical system was perfected and patented for the purpose of securing potash from feldspathic rocks, such as the granites, gneisses, and trap rocks of the Eastern seaboard states and elsewhere. For some reason very little practical progress was made, and the search for a domestic supply of potash was continued.

It happens that the Riverside Portland Cement Co., in California, some three years ago installed a dust collecting apparatus for the purpose of abating the dust nuisance that spread out over the adjacent country from the stacks supplying the draft feature to the operation of their cement kilns. The services of the Western Precipitation Co., of Los Angeles, was secured for the purpose of designing and installing an electrical precipitation system to reclaim the dust from the kiln gases and send it back into the mill for cement purposes. An experiment was first made with one stack, and later it was extended to embrace all of the stacks of the plant. From sixty to eighty tons of dust per day are now collected when the entire plant is running at full capacity, and it was very soon recognized that the dust contained a definite and appreciable amount of potash.

When the scarcity of potash made itself felt investigations were made to see if this content of potash could be profitably utilized, for previously the dust as collected was considered to be of no other value than the reclamation of so much cement making material. After making some changes of the operating conditions it was soon found that the percentage of potash could be materially increased, and that it could be successfully separated upon a commercial basis. At the present time the plant of the Riverside company produces several tons a day of a potash product which is about on a par as to quality with the low grade German salt that has been imported for years and always finds a ready market.

The dust-catching apparatus may be described in general terms about as follows: The stacks are tightly capped and the apparatus extends for a considerable distance on each side to new outlet stacks. The dust is caught in hoppers placed below precipitators, the heavier particles which are low in potash are the first to fall and are caught near the main stacks while the lighter material higher in potash is carried further and falls into the outer hoppers of the system, and so permits of the easy collection of

the lighter dust, high enough in potash to be of definite commercial value. The heavier dust is re-burned after mixing with enough raw material to yield a normal cement.

When running at about two-thirds of its full capacity with six kilns burning normal raw mix from the outer hoppers where the fine dust is precipitated about one ton per day per kiln is recovered which has a potash varying from ten to fifteen percent of the oxide. Hence the total daily production amounts to about ten tons of ten per cent potassium oxide. Such dust readily brings \$30 per ton, or from such an installation as that employed at Riverside about \$100,000 gross returns per year for the dust.

This by-product of Portland cement mills is an interesting feature at the present time and may develop into a very pronounced permanent improvement. The reclamation of the fine dust carried to waste by the stack gases will a little more than pay for itself as cement making material, according to the most conservative engineering calculations, and with the further precipitation of the potash bearing fines it becomes a profitable undertaking with potash at present commercial quotation and demand.

Pure potash salts are unobtainable. Quotations on the chloride and sulphate salts are nominally \$350 to \$500 per ton, but none is supplied, and probably none is wanted at such prices unless in very exceptional cases.

John J. Porter, general manager of the Security Cement & Lime Co., Hagerstown, Md., took a very early interest in the inquisition for a domestic potash supply when the war conditions in Europe cut off the imported article, and has given a good deal of study to the matter. He examined the Riverside plant about the first of the year with the result that the same kind of an outfit is now being installed at his plant in Hagerstown, which will come into bearing in June or July.

The Universal Portland Cement Co. is installing a dust collecting and precipitation process for producing the potash by-product of cement at its new mill just completed at Duluth, Minn. The dust nuisance feature of cement mill smoke stacks is familiar to everybody acquainted with the business, and the reclamation of the dust for cement purposes and for the potash by-product looks like an improvement worthy of consideration and study.

MARQUETTE "WHOOPS IT UP" FOR WHIPPLE.

Maintaining their reputation for striking originality, the Marquette Cement Manufacturing Co.'s sales force put one over on March 20 that will be written in the book as a history-making event.

All of the salesmen had been called into Chicago and the morning was spent at the office in conference. Luncheon was served at the Union League Club, where the afternoon session was held. At the close of this meeting, although A. J. Whipple, sales manager, had invited the boys to remain and have dinner with him, each one carefully bid Mr. Whipple "goodbye" and departed, presumably for their respective territories.

But during the day the salesmen had held several little conferences of their own, with the result that a big surprise party lay in wait for Mr. Whipple. The only stumbling block in the way was the problem of getting Mr. Whipple at the right place at the right time. The president of the Marquette

company, T. G. Dickinson, however, came to the rescue and promised to have Mr. Whipple at the head of the table at the appointed time. To the boys that was "Enuf said."

And promptly at seven o'clock Mr. Dickinson led Mr. Whipple across the Dutch Room of the Hotel Stratford to a flower bedecked table, where twenty-five loyal Marquette men stood with glasses raised to drink a toast to "the most likeable, liveliest and greatest sales manager in the cement business."

Mr. Whipple responded, as always, cleverly—incidentally remarking it was the first time he had been surprised since, when, as a boy, he was caught by a farmer in his watermelon patch near Winona, Minn. Mr. Dickinson showed his appreciation of what the boys have done so far this year by having distributed as place cards a substantial cash bonus for each man present.

Enough has been said to make plain that every one enjoyed himself royally during the evening. All the boys united to give Mr. Whipple the best time of his life as a token of their confidence in him as their leader and their feeling for him as a friend, man to man.

Those present were T. G. Dickinson, president; A. J. Whipple, sales manager; from the office: B. A. MacDonald, E. J. Bush, L. P. Payne; Chicago city salesmen: J. G. Evans, W. D. K. Rayburn, Henry Royer, N. V. Duncan; Illinois salesmen: G. S. Everingham, J. T. Maloney, L. W. Christy, W. H. Hurley, W. G. Joyce, F. A. Schmoeger; Wisconsin salesmen: W. H. Smeaton, C. L. Fitzgerald, C. L. Wiggins, L. A. Pettibone, L. Marston; Iowa salesmen: A. A. Schneberger, J. P. McNicholas, O. C. Hunt; Indiana salesmen: J. A. Douglass, H. S. Shrader, and Minneapolis, Minn., Representative R. B. Dickinson.

OPPORTUNITIES IN SOUTH AMERICA.

Philadelphia, Pa., April 18.—Information was recently received at the Bourse relating to the fact that there are wonderful opportunities for American manufacturers of cement to market their ware in South America. Exportations from England, France, Belgium and Germany having ceased, or having been greatly reduced, South America now finds itself in need of this article and with only a few home cement plants of any consequence. Before the war the four European nations named not only exported more cement than did the United States, but did a greater exporting business in proportion to the amount manufactured. France exported about twenty-three per cent of the cement she manufactured, and Germany seventeen per cent. American manufacturers have an excellent chance to increase their sales to South America to meet the former European figures, and the new markets, if handled intelligently, could be held after the war.

Henry S. Gray, secretary of J. B. Speed & Co., Louisville, Ky., reports the cement and lime market as fairly steady with active demand and prices firm. The company has filed amended articles of incorporation increasing the capital stock from \$60,000 to \$100,000.

The Kosmos Portland Cement Co., Louisville, Ky., reports the sale of 18,000 barrels of cement to the state highway department of Illinois.

The Louisville (Ky.) Cement Co. has been granted a building permit to erect a stucco warehouse at Thirtieth street and Broadway.

Crushing Plant Operated by a Cement Company

The management of the California Portland Cement Co. has shown its spirit of progress in the matter of a stone crushing plant, as it had previously done in dust collecting and potash separation at its well equipped mill.

This mill is based upon three kilns, 8'6" x 150'0"; five kilns, 7'6" x 120'0", and the necessary machinery for grinding and conveying the raw material, clinker and finished product.

It is not the purpose of this article to give details of the cement producing section, but to show the necessity of steady supply of raw material to insure continuous operation economically, and to describe the equipment and operations in securing the same.

This plant is located one mile from Colton, Cal., at the south side of Mt. Slover. Two quarries have been opened in this mountain, one east, and the other west of the mill and about 100 feet above the average level of the ground on which the main buildings are located. The west quarry is about 800 feet long and the east quarry about 1,100 feet long, with average faces of about 150 feet. A space of 800 feet between these quarries has been left in its original state, except sufficient excavations for tracks to the crushing plant, located about midway between.

Previous to the recent improvement the rock was broken in the quarry to a size that would feed to a No. 6 gyratory crusher. The loading was done by hand on three yard quarry cars with a door at one end. These were run to the dumping platform at the crusher by gravity, the grade being from 1 to 2½ per cent. Cars were provided with a brake operated by a man with each car. Empty cars were hauled back by a mule. The cars were dumped by means of an air hoist which lifted the rear end, dumping the stone into one of two chutes about 4' square and 25' long, which supplied the two No. 6 gyratory crushers. The product of the two crushers passed direct to a large swing hammer pulverizer which reduced it to cement size, delivering to an elevator, thence to a belt conveyor with tripper to distribute to storage bins with a capacity of about 6,000 tons. This outfit had given very good service, but had the drawback of a large amount of blasting and labor to bring the rock to the required size, and that the capacity was but barely sufficient to supply the cement mill. Commercial sizes of rock could be furnished only with great difficulty.

The cement company secured a very large contract for crushed rock for road improvement in San Bernardino county, and felt warranted in erecting a crushing plant of large capacity, one with a large initial crusher to take rock loaded by steam shovel. With a view of getting the best results in arrangement of that class of machinery, the first step was to secure the services of a man of experience in that line, and J. M. Sholl, E. E., of Milwaukee, was chosen to work out the problem.

The stated requirement was a capacity of at least 200 tons per hour, with provision for increasing to at least 300 tons per hour, the initial crusher to have a feed opening of 84" by 66". The product when used for cement was to be reduced to ¾" ring size. Two classes of rock were required for road building. Class "A" for macadam road work required three divisions—No. 1 from ¾" to 3" ring size; No. 2 from ¾" to ¾" ring size; No. 3, ¾" and smaller. Class "B" for concrete road work required crusher run with dust removed, or all between ¾" and 2½" ring size. It was desirable to shift readily from one to the other class or to the regular cement size.

This was all worked out as follows: The location selected was as near as possible to the old plant, being about midway between the two quar-

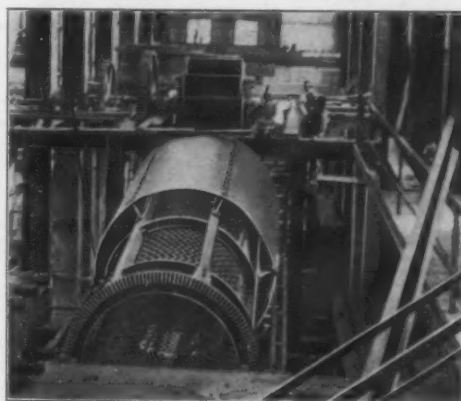


THE CRUSHER PLANT UNDER CONSTRUCTION.

ries and having the best track facilities for loading cars with commercial rock. The delivery of cement rock to storage bins was facilitated also. Part of the building of the old plant was torn away while it was in operation, and the new bins could not be completed until the old plant was abandoned and torn down.

The top of the jaw of an 84" x 66" Superior jaw crusher was placed 5½' below the established quarry track level, which was 2' above the old track level. This crusher reduces the stone to 10" size and discharges directly into a No. 9 McCully crusher which is set to 3¾" product, delivering to a 48" pan conveyor, 56'0" centers, which elevates the product to an 84" x 20'0" rotary screen. This screen separates into four sizes; first, ¾" and smaller which is a finished product; second ¾" to 2½" which is for road material, a finished product, but for cement it is spouted to a hammer mill to be reduced; third, 2½" to 3" which is finished for road material (Class "B"), but must be reduced for cement or Class "A" by being passed to the hammer mill, or to the No. 6 crushers. The fourth size, or rejections, go to two No. 6 crushers, the product of which with that of the screen and the hammer mill go to a 48" pan conveyor, 81'0" centers, which delivers to an 84" x 24'0" sizing screen over storage bins. This screen delivers its product as follows:

When cement rock is being produced, all sizes



ONE OF THE SEPARATING SCREENS.

above ¾" are returned by means of spouts and an inclined belt conveyor to the hammer mill. If Class "A" rock is being produced, the dust is sent to the cement storage, the ¾" to 2½" size being spouted to two bins, and the material over 2½" is returned to the No. 6 crushers. If Class "B" is required, the three sizes are delivered to separate bins, only the oversize being returned to the No. 6 crushers.

A notable feature of the storage bins is that each of the sizes except the dust has two pockets, each 16' long, with two spouts from each for loading railroad cars. This admits of loading a car without shifting it. Conditions were such that it was necessary to use side spouts for loading cars. The opposite side of the bin is provided with spouts for loading wagons and auto trucks. Under the bin is provided a set of spouts delivering to a best conveyor, which in turn delivers to the rejection conveyor. This arrangement allows any class of rock in the bins to be returned to the hammer mill to be recrushed, if desired. A single outlet in the bottom of the bin admits a cast iron three-way spout with one branch to each side of the bin and one to the conveyor.

The supporting structure of the bins consists of a monolith of reinforced concrete, the floor and floor beams being carried by columns. The bin sides are of cribbed construction. The main building is of heavy structural steel, carried on walls or piers of concrete. The pits are all concrete lined, and the foundations are of reinforced concrete. In places the concrete walls are fifty-four feet high.

All of the machines have individual drives except the screens, and the motors with three exceptions are placed in lean-tos to the main structures. This enables the motor to be separated from the crushing machinery and protected from dust. The motors with three exceptions are of the squirrel-cage type. The following is a list of the motors used with the machine driven:

- 250 HP slipring induction motor for Superior jaw crusher drive.
- 150 HP s.r.l. motor for No. 9 McCully crusher drive.
- 25 HP s.r.l. motor for car dump.
- 250 HP squirrel cage induction motor—hammer mill drive.
- 50 HP s.c.i. motor—No. 6 crusher drive.
- 50 HP s.c.i. motor—No. 6 crusher drive.
- 75 HP s.c.i. motor—56' pan conveyor and screen.
- 75 HP s.c.i. motor—81' pan conveyor and screen.
- 25 HP s.c.i. motor—rejection belt conveyor.
- 20 HP s.c.i. motor—conveyor to storage.
- Two 10 HP s.c.i. motors—conveyor to storage.

Foundations are provided for motors for driving an additional No. 9 McCully crusher and a hammer mill, which will increase the capacity from 225 tons per hour to about 350 tons per hour.

All the motors not on hand were purchased of the General Electric Co. The 84" x 66" Superior Jaw crusher, the No. 9 McCully crusher, the two pan conveyors, two screens and car dumping device were furnished by the Power and Mining Machinery Co., of Cudahy, Wis. The hammer mill and two No. 6 crushers were taken from the old plant, the belt conveyors were furnished by the Link-Belt Machinery Co. The steel building was fabricated and erected by the Llewellyn Iron Works, of Los Angeles. A stiff leg derrick with a 110-ft. boom being used for erecting. Four of the building columns were about 70' high.

For erecting the machinery a forty-ton crane was provided. The travel of this crane is from a spur of the main siding which enters the building to the opposite end of the building, serving all of the machinery except the long pan conveyors and its screen. This made it possible to erect the machinery rapidly and deliver quarry cars and other equipment from the lower to the higher level. The steam shovel was hauled up a newly built roadway on which temporary track was laid, by its own power, using a 1¼" wire cable anchored in one of the concrete walls. The concrete for all purposes was spouted from a tower centrally located and was composed of cement, crushed rock and fine screenings from the crushed rock. The rock and dust

were delivered by belt conveyors from the old plant to a point near the mixer at the foot of the tower. The cement was delivered by truck. This made the cost per cubic yard of concrete very low.

The quarry equipment consists of a 100-ton Bucyrus steam shovel with a special large dipper; six ten-cubic-yard, side dump, lift door quarry cars; and, two 9-ton standard gauge electric storage battery locomotives, built by the General Electric Co. The quarry cars were furnished by the Kilbourn Jacobs Manufacturing Co., Columbus, O., the body being mounted on six heavy springs, to absorb the shock due to large rocks being dropped into it; the body is pivoted on one side and is dumped by lifting the opposite side by car dumping device, which consists of two hooks that engage the angle on the lower edge of the box and are lifted by two chains which wind on cams mounted on a heavy shaft above. This shaft is turned by a worm wheel, the worm shaft serving as the pinion shaft of a back-gear reversible induction motor. A train of four cars can be handled by one locomotive. The cars are dumped upon an apron or chute, which concentrates the delivery to the crusher. This chute is lined both bottom and sides with 2" rolled steel plates. A very substantial bumper is provided opposite the dump to take the impact of large rocks. This is built of 100 pound T-rails mounted on an armored wood cushion backed by heavy beams seated in concrete pockets in the pit wall.

In addition to the above, provision is made for dumping the old quarry cars at either side of the crusher. A charging station is provided for the storage battery locomotive with the necessary motor generator set. The building is of steel and has facilities for easy handling of batteries, etc., besides two repair pits.

Before the new plant could be operated, it was necessary to close down and dismantle the old plant, moving the hammer mill, two No. 6 crushers and three motors and installing them in the new plant and providing the necessary spouts and platforms. It was also necessary to extend the 30" belt conveyor over the cement rock storage, a distance of 53' to receive the product from the new plant. A temporary support was necessary until the old plant could be torn down and a steel bridge erected. Meanwhile the quarry tracks were being changed from 42" gauge to standard gauge. A narrow gauge track was laid to allow the small cars to reach the jaw crusher.

With a limited supply of rock on hand for the cement plant, it was very important that the change be made in a short time, and that the new plant should not fail to produce from the start. Failure to keep up the supply of cement material would, of course, entail great damage. From the time the word was passed till the new plant was in operation was less than three days. Each of the machines performed its proper function from the start. It is not often that a plant of this size can be put in operation without some delays, neither is an enterprise of this size often carried to completion without serious accident. This case proved to be one of the exceptions.

This installation called for many changes to insure safe and economic operation. The quarry floor is to be lowered to reduce the grade to $\frac{1}{2}$ per cent, which will require excavation up to 7' in depth. Entire new quarry track of heavy rails was installed. About 2,000' of siding for commercial rock cars was shifted to a higher level and an additional 500' was built. About one mile of good truck road is included in the plan, making the most complete outfit of the kind ever undertaken by a cement company in developing a by-product.

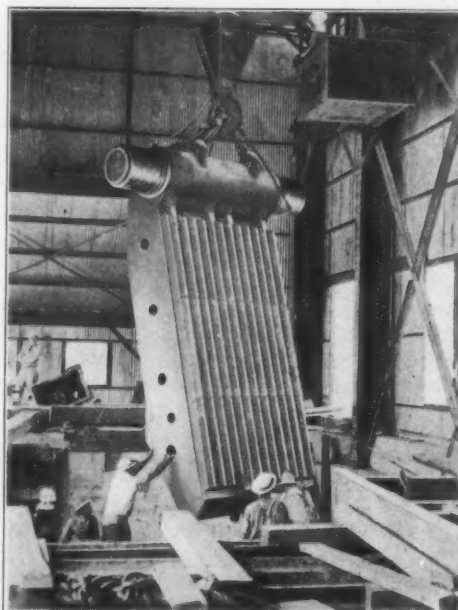
The moving spirit of this enterprise is T. J. Fleming, Secretary and General Manager J. M. Sholl, E. E., of Milwaukee, Wis., was engaged to design the crushing plant and supervise erection. He was very ably assisted by the company's engineer, C. A. Hutchinson, who detailed the reinforced concrete

and steel work. The execution of these plans was looked after by Mr. Griffith, civil and construction engineer at the cement plant, and Mr. Garson, the millwright. Every possible assistance and co-operation was rendered by acting superintendent E. J. Strock.

GAS BELT MANUFACTURERS ANTICIPATE GOOD YEAR.

Kansas City, Mo., April 18.—Conditions in the central west continue good. Fair weather, with enough moisture to make the agricultural outlook favorable—better than any year possibly in the last ten, with the exception of 1914 and 1915—has kept material moving out to small retail trade at a rapid rate. Nor has the cement industry yet felt the steady pull of small retail business. At the time of low prices in January, dealers stocked up to the fullest capacity of their warehouses. These stocks are just recently becoming exhausted. Orders at the higher market are now coming in, and from now on should pour in at a rate highly gratifying to manufacturers.

There is hesitancy in the field of larger construction. Large municipal, county, and private projects



ONE OF THE BIG CRUSHER JAWS.

are not materializing as rapidly as might be expected, nor as conditions would warrant. It is difficult to explain municipal and county hesitancy. A good level of prices should not act as a deterrent. Structural steel is not largely used in such work, and industrial and agricultural conditions are such that all communities are in prosperous shape. It is probably simply a marking-time attitude that will swing in activity in a short time. City politics, settled in early April, undoubtedly was a factor in many municipalities. In the field of private construction, structural steel conditions probably have their effect; but with the reinforcing situation in such comparatively splendid shape in sharp contrast to structural steel, reinforced concrete construction will probably receive a great impetus this year.

At that, the year can in no wise be viewed pessimistically, especially when compared with last year. Many cement companies are probably enjoying right now banner months for early spring. It will be recalled that the first half of 1914 was also a great period. The outbreak of the war with the sad showing of the August-December period is what brought the year's total to ordinary figures. Whether this year will receive some such crimp is a matter for speculation. Possibilities of war either across the water or in Mexico, and the effect

of the political campaign are both probably entitled to some consideration.

Labor shortage has as yet not disturbed this section. Nor has car shortage spread its blight over us.

In any event, the activities of the gas belt cement manufacturers show how they regard the year's prospects. Several mills have been putting in repairs, adding equipment and making desirable changes. They are urging their dealers to take large cars and to return sacks often, in order to insure ample sack stocks when larger movement comes. Judging from their attitude of mind, 1916 will be a big year for all material men.

SANDUSKY CHANGES CORPORATE NAME.

The corporate title of the Sandusky Portland Cement Co., Cleveland, Ohio, has recently been changed to that of the "Sandusky Cement Co.," the officers and directors in the new company being the same as those of the old concern. There will be no other changes of any kind, whatever, the business of the company being carried on as formerly.

The company has just issued a "broadside" for the retail trade, calling attention to the extensive advertising campaign now being conducted in farm journals and magazines devoted to the improvement of country estates and suburban homes. The campaign will be conducted with the cooperation of retailers who are being supplied booklets pertaining to the various "Medusa" products, electrotypes, lantern slides and other advertising matter.

NEW PLANT FOR SOUTH AMERICA.

The Novella Cement Co., which has recently been incorporated in New York City, is about to erect a cement manufacturing plant in Guatemala City, Guatemala, South America, which will have a daily capacity of 200 barrels. The Ruggles-Coles Engineering Co., of New York City, has been engaged as engineers and has designed the plant, which will be equipped with ball and tube mills and rotary kiln. All of this machinery has already been ordered. Electric power will be used to operate the plant and raw materials will be secured from a lime rock and volcanic ash, on the site of which the plant will be located.

According to the plans, the raw material will be brought to the plant and the clinker stored and reclaimed by a cable hoist carrier located centrally above the plant and the buildings, being so arranged that all materials to be handled by the cable hoist carrier will be in a straight line.

HIGH FINANCE BEING AIRED.

Philadelphia, Pa., April 18.—High finance, of the blue sky variety, in cement, is being aired in a suit before Judge Dickinson, in the United States District Court, by the receiver for the \$5,000,000 Seaboard Portland Cement Co., who is endeavoring to recover \$2,000,000 from the directors of the demolished concern.

The present suit, brought by William F. Allen, receiver for the company, is directed against George W. Roydhouse, president of the Roydhouse-Airey Co., contractors and builders. Mr. Roydhouse, in the suit, is charged with dereliction of duties as a director of the Seaboard company. The company was organized in May, 1907, and Roydhouse became a director in April, 1908.

The Castalia Portland Cement Co., which has headquarters in this city, announces that its plant at Castalia, Ohio, is running full and that sales and shipments there are much better than in 1915. It has been making general improvements to its plant this spring so that it is now in fine shape for a busy season.

ROAD BUILDING

Missouri Road Engineers Consider Concrete.

The ninth annual meeting of the Highway Engineers' Association of Missouri was held in Kansas City late in March. Several addresses were devoted entirely to concrete while others on various phases of permanence gave due prominence to concrete construction. These addresses were: "Concrete Bridge Construction," by Lloyd Smith, president of the Topeka Bridge & Iron Co., Topeka, Kan.; "Concrete," by B. P. Naylor, of the Iowa Portland Cement Co., Kansas City; "Permanent Bridges," by Daniel B. Luten, of Indianapolis, Ind.; "Permanent Roads," by J. M. Lowe, president of the National Old Trails Association; "How Shall We Get Better Results in Road Work in Missouri," by Col. F. W. Buffum, state highway commissioner, and "The Utility and Construction of Concrete Roads," by A. N. Johnson, of the Portland Cement Association.

The address of Mr. Johnson made a distinct impression and was perhaps the most important practical development of the meeting. After reviewing the revolution that has taken place in the use of American highways during the past decade the speaker got down to the practical applications of concrete road construction in the following words:

A few of the points to be borne in mind concerning the concrete road are first, the same materials which made the water-bound macadam of such nearly universal application, broken rock, is the basis of the concrete road. It may be said broadly that the same materials that would apply in the construction of water-bound macadam may be used in the concrete road. Materials suitable for concrete roads are more widely distributed than any other materials of which we know that may be used in the construction of durable roads. To these materials it is necessary to add not over ten or twelve per cent of their weight of anything that must be manufactured and shipped from any considerable distance. This is the cement. Therefore in those localities where there is to be had crushed rock or good gravel, ninety per cent of the road is built of local materials.

Second, the methods of construction that are to be used in the concrete road make it possible to employ the average workman and does not require a large number of men specially skilled in the particular form of construction as is the case with most other types of road construction which might be at all suitable.

Third, for these reasons the cost of the concrete road is the lowest cost for any type of road which will give equal service with as little cost for maintenance. Many miles of road and millions of dollars have been spent for road construction without giving any thought to maintenance charge, and it is when we consider the maintenance cost of the concrete road, together with the first cost, that the economy of this form of construction is so apparent.

And when we examine the maintenance cost of those road systems where an attempt is being made to maintain roads of a type of construction which is not suitable for the traffic, the necessity for understanding the maintenance cost will be a controlling factor in the selection of the type of road to be used is seen.

Probably the best object lesson showing the cost of maintaining a type of road that is not suitable for the traffic that is to be accommodated is to be had from the experience on the Massachusetts state highways. As every one knows, these roads have been maintained for many years in a high state of repair and that the state highway system has been in use for many years. These roads were originally constructed for the most part as water-bound macadam, and until ten or twelve years ago could be maintained at a nominal cost. This cost of maintenance on the Massachusetts roads was probably higher at that time than the reported cost of maintenance on most other macadam roads, the explanation being that the Massachusetts roads were maintained in a much higher state of repair than those anywhere else. While it may be shown that here and there roads were maintained somewhat cheaper they were not maintained as a rule in a condition that would make them comparable with those of the Massachusetts highway system. For this reason these figures are of greater significance.

From the reports of the Massachusetts Highway Commission in 1906 the average cost of maintenance

per mile per year was \$110. At that time there were 7,327 motor cars registered in the state; in 1907 there were 8,200 cars and the average cost was \$158, and in 1911 there were 44,000 cars and the average cost was \$633, while in 1915 there were over 89,000 cars and the average cost for maintenance of 1,025 miles of road was \$1,001.94, the total expenditures for maintenance for that year being \$1,260,222. What can be more illustrative and significant than these figures. The conclusion is that in Massachusetts at present an attempt is being made to perpetuate a failure. When the cost of maintenance under traffic conditions for which the roads were at first built was but \$110 and under modern traffic conditions the expense is \$1,000, and the roads are not today as satisfactory for the traffic that they now accommodate as they were ten years ago, it is evident that a great change has taken place.

Let us compare these figures with the cost of maintaining concrete roads subjected to modern traffic conditions. In 1915 there had been constructed in Illinois by the State Highway Department about one hundred miles of concrete roads in different parts of the state. The total cost of maintaining these roads, which included the cost of keeping the weeds cut, the gutters, drains and culverts opened, was \$106 a mile. The cost for the maintenance of the concrete slab proper was \$29.87 a mile. In 1915 there were maintained by the Ohio State Highway Department a little over 107 miles of concrete roads. The total cost of maintenance on these roads, including culverts, road side, etc., was \$17,500, while the cost for the concrete slab proper was \$3,640. Thus the total cost per mile per year was \$163 and the cost for the maintenance of the slab proper was about \$34. The reports of the county highway engineer from Milwaukee county where there are about ninety miles of concrete road subjected to very heavy traffic has been from \$26 to \$30 per year per mile for the maintenance of the concrete slab proper. The maintenance cost of the Wayne county (Mich.) roads, totalling about 130 miles, some of these roads six and seven years old, has been about \$30 a mile a year.

It is to be borne in mind that the effect of six or seven years traffic on a concrete road which has not had an average cost of maintenance to exceed \$30 a mile is still in the same condition to carry traffic that it was the day it was laid. The effect of the actual wear on the concrete is scarcely noticeable. The maintenance cost has been incurred because of keeping the joints and cracks which have occurred filled with tar or some other mastic and this must be done each year. In other words, there is no evidence whatever of an increasing cost of maintenance due to traffic as is shown by the history of macadam roads treated with bituminous topping.

It is difficult to state what the first cost of a concrete road would be in a given instance, as it is evident it will depend upon the cost of the materials on the ground, that where the situation is such as will demand a considerable freight haul and a long wagon haul that the cost will be greater than where materials lie closer at hand.

The average cost per square yard for concrete roads in 1915 in Connecticut was \$1.13; in Illinois, \$1.03; in Indiana, 98c; in Kansas, \$1.28; in Missouri, \$1.09 and in Ohio, \$1.02.

There is to be found a record of no road construction that offers the same rigidity and durability and low cost of maintenance and low first cost as the concrete road, and no one entrusted with the duty in selecting the type of road for a system of main highways of a state or county can ignore in such a consideration the claims of the concrete road.

Slides and films from the United States Department of Good Roads were shown illustrating road conditions and the construction of concrete roads.

MUCH ROAD WORK FOR WISCONSIN.

Milwaukee, Wis., April 19.—More than \$4,500,000 will be spent upon Wisconsin highways during 1917, according to present indications. Reports received by the state highway commission of funds appropriated by towns in the election of April 4 point to a probable total of more than \$1,500,000 when all towns have been heard from. Under the state aid law, the counties where the towns are situated and the state are each required to provide an amount equal to that voted by the towns. This will bring the grand total to more than \$4,500,000.

Sealed bids will be received at the office of the Milwaukee county clerk until April 27 for paving several roads leading out of Milwaukee, including Vliet street from Milwaukee city limits

to Wauwatosa city limits, and Washington boulevard from Milwaukee city limits to Wauwatosa city limits.

Members of the Green Bay Avenue Advancement Association of Milwaukee recently met and passed a resolution favoring the use of brick for a proposed new pavement on that street.

The common council of Hartford, Wis., awarded the contract for paving Main street to Fred Eul, of Menasha, at \$15,698.

The common council of Appleton, Wis., has awarded the contract to Greinke Brothers for paving West College avenue with concrete at \$21,087.51.

The board of public works at Racine, Wis., has awarded to the Birdsall-Griffith Construction Co., the contract for paving Asylum avenue with brick. Portions of Albert street, Mound avenue to James Cape & Sons, brick; Douglas avenue to the same firm, brick to be used.

The county board of Sheboygan county has awarded the contract to the Garvel-Weyenberg Construction Co., of Appleton, Wis., at \$7,847.55 for concrete paving, culverts, etc., for the Calumet plant road, town of Sheboygan. The county board has awarded the contract for 3,100 barrels of cement to the Sheboygan Lime Works.

The common council at Marshfield, Wis., has awarded the following contracts: Cast Stone Construction Co., Eau Claire, Wis., 14,000 yards of reinforced concrete for paving; the Peterson Construction Co., Kenosha, 16,000 yards of vitrified brick paving, at \$2.10 per yard.

Drainage and Preparation of Subgrade.*

It is practically impossible to formulate specific directions for the preparation and drainage of the subgrade, that will be of general application. Every piece of road construction involves problems that are complicated by local conditions, financial as well as physical, and that must be solved each by itself. The utmost that your committee can do is to consider ways and means of obtaining, as nearly as local circumstances will permit and at minimum expense, a dry foundation that will provide uniform bearing power for the pavement. It is agreed that moisture in the subgrade directly under the pavement is likely to be destructive to the surface in several ways, chiefly because of unequal vertical movements caused by frost action or unequal swelling or shrinkage of the soil due to lack of uniformity in drainage. It is also to be recognized that only quick drainage is effective for roadways. On the other hand, there is no unanimity of opinion as to whether, because perfect drainage is hard to secure, it is cheaper and better to reinforce the pavement sufficiently to withstand stress set up by frost action or similar movements, or to take additional precautions about drainage. Either expedient will involve additional expense; and which is better must be determined by study of the situation. The necessity, or at least the desirability, of spending more time and money upon thorough preliminary investigations cannot be too strongly emphasized. Such expenditure is in the end a real economy, too little appreciated; and parsimony at the inception of a project often results in needlessly inferior location as to soil and drainage, as well as to line and grade, with consequent increased cost of construction or permanently poorer roads and increased cost of maintenance.

Clearing and Grubbing.

All trees and undergrowth should be cleared from the area within the slope-stakes, and from such additional space on both sides of the road as may be necessary to allow a clear view for traffic in both directions; to allow for ditches and other provisions for drainage; and to provide for the proper construction of the road, and for its permanency and its maintenance. And all such material should be destroyed or otherwise removed from the right-of-way. A general clearing of trees is often unnecessary or objectionable; and the value of trees and even bushes, from the standpoint of beauty, comfort to travelers, pre-

*Committee Report presented at the National Conference on Concrete Road Building, 1916.

vention of soil-wash, and protection to the roadway, should be more generally recognized. Intelligent trimming of the lower branches will in many cases serve every purpose that can be accomplished by cutting down a tree. Trees should not be carelessly or thoughtlessly sacrificed. Under shallow embankments even long grass or a thin layer of decayed vegetable matter is in general objectionable, because preventing adhesion of new material or causing soft spots; and such matter should not be permitted at or near the surface of the finished subgrade.

The roadway should be grubbed to the full width of excavation; and roots and stumps should be removed from drainage ditches and wherever they will interfere with underdrains, and under embankments so shallow that the decay of the roots and stumps will ultimately cause unequal settlement of the fills. In case their removal is not necessary stumps under fills should be cut off within 1 foot of the ground, elsewhere within 3 feet. It is customary to stipulate some limiting height of embankment such as 5 feet, which makes grubbing unnecessary. The committee submits that such a limit is undesirable as a minimum; much will depend on the number of stumps, their size, the kind of soil and other local conditions; every precaution should be taken to prevent unequal settlement and so simple an expedient as extra grubbing should not be neglected.

Provisions in the contract and specifications to allow payment for clearing and grubbing by the tree or stump, or some small unit, instead of by the acre or square, should in many cases lead to better treatment of these matters.

Excavation and Embankment.

Four types of cross-section for the subgrade are in use: (1) Subgrade crowned parallel to the concrete wearing surface, which is made of uniform thickness. (2) Subgrade crowned somewhat less than the concrete, which is made thicker at the center than at the sides. (3) Flat subgrade, all the crown being given by varying the thickness of the concrete. (4) Dished subgrade. The opinion seems to be gaining ground that the last-mentioned form, the slab thickened at the center and built on a flat or dished subbase, is best suited to resist cracking, as well as to withstand heavy loads. Whatever form is to be used, and whether the surface is finished smooth or rough, the subbase should be made of uniform texture, so to speak, should be finished true to the specified outline, and should be kept free from holes, tracks, and ruts until the concrete is laid.

The side slopes to be given to cuts and fills should be determined by studying old railroad or highway embankments in the immediate locality; and the grading should be finished to conform accurately and neatly as to line, gradient, and side slopes, with the specifications. In general the fills should be made from the cuts and the material excavated from drainage ditches; it may, however, be cheaper to borrow dirt than to handle it from the ditch excavation. But the dirt taken from ditches must be so placed that it cannot wash into and refill the ditches or interfere with drainage. Borrow pits must be thoroughly drained. In case the excavated material exceeds the requirements for fills, provision should be made in the contract and specifications that the excess should be used to widen the embankments; the higher ones, being more dangerous for traffic, should first be widened. Side slopes of cuts and fills should be seeded with some grass suited to the climate and soil.

After the removal or destruction of the perishable matter, the surface under new embankments should be roughened wherever the new material is likely to slide; and on the sides of old embankments, or side-hill slopes, well defined steps or benches should be made. New earth should be deposited and rolled in layers not exceeding 1 foot in thickness, and the thickness should be varied according to the kind of material available and the type of roller to be used. In some cases the layers should be as thin as 1 or 2 inches. In general a self-propelled roller weighing 10 tons or more will compact the subgrade cheaply and effectively. For some kinds of soil so heavy a roller is not suitable, and better results can be obtained from lighter machines; and in other materials better results can be attained by the use of grooved rollers or tamping rollers, because the wide, smooth rollers, even when heavy, span over the soft spots. During rolling, the embankment should be kept slightly moistened. The quality of the material to be used in embankments should be considered carefully; and specifications should make definite provision to permit the engineer to reject unsuitable material either from cuts or borrow pits. Your committee suggests that while experience in one locality will enable one to judge of the merits of the material available with more or less accuracy, there are not definite tests, so far as we know, by which the merits of different earths may be predetermined. This seems to offer a profitable field for scientific investigation. In general it is not desirable to build a concrete surface on any but the shallowest fills, even if the work is thoroughly rolled, until the earth has settled for at least one season.

If the subgrade is an old road surface of gravel, broken stone, or earth, it is likely to be uneven and far from uniform as to bearing power. Filling the low places with suitable material, and rolling, will sometimes suffice to make the old surface into a good subgrade. More often, however, this is not sufficient; and the only satisfactory way is to loosen the old material by scarifying, spading, or plowing, then harrow or cultivate, and re-roll it. In some cases, such material should be removed, respread in very thin layers and rolled until uniform and hard.

The subgrade in cuts may be shaped by any suitable method; but unless the soil is of a kind that

unquestionably will not compact, it should always be rolled until uniform and hard. Any soft or low places developed by rolling should be filled with suitable soil, the undesirable material being removed, and the surface re-rolled as may be necessary. In some instances, the desired necessary uniformity of surface can be attained only by loosening and cultivating the soil to a depth of 6 or 8 inches and rolling; and in other cases this loosened material should be removed, respread, and rolled in thin layers of 1 or 2 inches. Certain clay soils when wet can be rolled only if covered with a layer of sand, gravel, or dry loose earth. In some instances straw or similar material may be used to facilitate rolling. Drainage trenches, if placed under the subgrade, should be completed before the rolling is done. If back-filling trenches the material should be thoroughly tamped in thin layers; and if the trenches are re-filled with broken stone or screened gravel, this should be covered with a few inches of sand, loam, fine gravel, or material taken from the immediate excavation, in order to provide a uniform bearing surface and prevent mortar from the concrete from leaking down among the loose stones.

Excavations for drainage should be definitely and carefully arranged for in the specifications, and executed with as much care as any other part of the work.

Drainage.

Road drainage in general involves the disposal of (1) surface water flowing to the road from outside areas; and (2) rain falling on the road itself; and often (3) underground water from outside areas. Problems of road drainage should be approached with the fundamental idea that to be effective in protecting the road surface a drainage system must be capable of acting quickly. Underdrainage is of necessity slow drainage as compared with surface drainage; and every reasonable provision should be made to dispose of surface water coming to the roadway by surface drainage, and to keep it out of the foundation. The conditions imposed by the location often make it necessary that surface water shall be handled by underground channels or even underdrains; but in such cases the underdrains should be proportioned for storm-water capacity and not as for underdrainage alone.

The most obvious and effective way to dispose of surface water coming from outside the road is by means of surface ditches dug outside the top of cuts or along the toes of fills, on one or both sides, as may be necessary. Such ditches protect the side slopes and roadway from wash, diminish the amount of water to be carried by the road gutters, and thus increase their stability, and keep the foundation drier than if all the water coming to the road has to be handled in the gutters. The destructive results of depending upon the road gutters to handle all the surface water were forcibly demonstrated in the regions which were visited by the heavy rainfalls of the summer of 1915. In many cases the road gutters must carry all the water from outside as well as water drained to them from the road surface, and such a condition should be recognized in designing. Ditches and gutters should be of liberal capacity. They should have outlets into culverts or streams at such frequent intervals that the volume of flow will not accumulate to destructive proportions in the channels themselves, nor cause damage when discharged on adjacent land. Gutters immediately adjacent to the traveled surface should be broad and shallow, rather than narrow and deep, because flat ditches are easier to maintain, and are not dangerous to traffic. In general, the proportioning of ditches and gutters may be done successfully without resort to a detailed study of rainfall, run-off, or the hydraulics of flow in channels; but in important or unusual cases and in proportioning culverts such a study should be made.

Your committee has assumed that the design of culverts and storm-water systems for urban streets is too detailed a matter to discuss in this kind of a paper.

Rainfall on the roadway should be disposed of by surface drainage as far as possible; and the road surface, shoulders and gutters should be shaped and built with this end in view, and to minimize seepage into the foundation. If the entire roadway between curbs is covered with dense concrete, well surfaced and sufficiently crowned, and if the road is adequately provided with catch basins and culverts, water falling in the road should give no trouble. But if the concrete is more or less absorbent, and its surface is irregular, or leaky, or if car-tracks are laid in the street, unless the foundation is naturally dry and sufficiently open to carry off such water as may leak through, some definite provision for handling this water should be made. A layer of coarse sand, cinders, gravel, or broken stone, or shallow blind drains, 10 inches to 12 inches deep, at intervals of from 25 to 50 feet, and draining downhill at an angle with the center line, either into the side drains or gutters, will usually serve to take care of such seepage water. Unless there is ground water in the roadway such a condition should in general be obviated by good construction.

If the roadbed is in finely divided, retentive, water-bearing soil, some system of underdrainage should be devised that will permanently lower the water table beneath the concrete, and keep the subgrade uniformly dry for a sufficient depth to eliminate the destructive movements caused by freezing and thawing or resulting from alternate saturation and drying of the soil. Finely divided material is in itself slow-draining, and other things being equal, the finer the material the more readily will water rise by capillarity. Underdrains in such soil necessarily operate slowly, and the work required of them should be

diminished as much as possible by other expedients. The direction of the underflow should be ascertained, and the drainage ditches outside the roadway should be deepened, if feasible, to divert as much ground water as possible into the nearest culvert or cross-drain. A special ditch for ground water between the surface ditch and the roadway is often desirable; and localized underflow of considerable volume, such as springs, should be provided with direct and ample channels.

The kind of soil, the lay of the land, the amount of water, and other local conditions such as the availability of suitable materials, will determine the method of underdrainage to be employed. The choice would in general be from among the following: (a) Pipes of vitrified clay or cement concrete laid in trenches, backfilled with the material excavated from the trenches, that is, "farm drains." (b) Pipes laid in trenches backfilled with broken stone, gravel, cinders, or similar open material. (c) Trenches filled with stone or gravel, without pipes, "blind drains." (d) Layers of cinders, gravel, broken stone or similar material varying in thickness from a few inches to 12 or 15 inches, under the entire road surface. (e) A layer of similar material laid in a shallow longitudinal trench with the cross-section of a flat letter V, and known as "V" drains. (f) Two or more of these methods used in combination.

Of the three types of trench drains, a pipe covered with coarse gravel or similar filling, for the whole depth of the trench, is the most effective. It will act more quickly than the farm drain, or the blind drain; has more capacity, other things equal; and it serves quickly to take care of that part of the surface water that in most cases eventually gets into the ground.

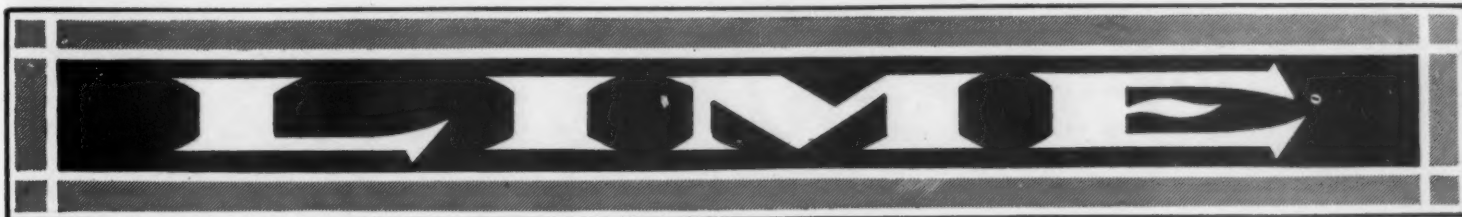
Pipe drains smaller than 4 inches in diameter should not be used, and a larger size is better. Drains should be given as much fall as feasible to facilitate the removal of silt and to increase their capacity. Water will flow on very flat grades, but more slowly, and in general drains laid on a flat grade will not lower the ground water as much, nor drain as large an area as on steeper slopes. The depth of drains is an important factor in determining the area drained, and to a certain extent the uniformity of drainage. In very fine soils the slope of the ground water table toward the drains must be very steep, in order to carry off the necessary amount of water, often as steep as 1 in 10 and occasionally steeper. Drains should be laid at least $2\frac{1}{4}$ to 3 feet below the subgrade, and 4 feet is often better. Unless the drain is laid to sufficient depth it will not lower the water sufficiently under the entire roadway; but rather than increase the depth much over 4 feet, it is usually better to lay additional underdrains.

The location of drains in trenches should be such as will most effectively cut off the ground water and keep it from rising into the top of subgrade. In general that will be one line laid parallel to the center line of the road on the side from which the underflow comes, or one line on each side; or a succession of transverse lines laid at a sloping angle across the road. There is much well-founded diversity of opinion as to the relative merits of the two types. It may fairly be said that cross trenches are likely to form weak spots under the concrete, owing to the difficulty of getting them properly backfilled, and they should if possible be placed outside. It is desirable to lay underdrains as long as possible before building the road surface, especially if the concrete is to be laid late in the autumn. In many instances a layer of sand, gravel, stone, or cinders has been found to work more satisfactorily than drains in trenches. The committee believes that in very wet foundations the most effective method is a combination of two of the above types, such as pipe laid in trenches 3 feet deep, more or less, at each side of the road and draining into catch basins or culverts in city streets at or under the curb, otherwise in the shoulder, just outside the ends of the concrete, the trench to be backfilled with coarse gravel, cinders or broken stone. In addition the whole subgrade under the concrete should be covered with a layer of similar material or sand, which makes with the trench filling a continuous drain as well as an insulation for the concrete. Where such loose material is not available, lateral drains laid at depths of 12 to 18 inches, at intervals of 20 to 40 feet across the roadbed from the side drains and draining into them, may serve the same end. The problem is to keep the subgrade dry by the use of such resources and material as are available.

MORE BRICK ROADS FOR FLORIDA.

Birmingham, Ala., April 1—John W. Sibley, secretary of the Southern Paving Brick Manufacturers' Association, on his return from a trip to Florida, stated that a contract for 46 miles of paved highway has been awarded by the officials of Volusia county. The paving material will be vitrified brick, and the cost will approach a half million dollars.

Mr. Sibley stated that over 100 miles of paved highways was constructed in Florida last year and that it proved one of the best investments of the state, as hundreds of automobile tourists were attracted by the good roads of that state, with the result that thousands of dollars of revenue was derived by its business interests.



Refractory Binder From Dolomite.

The Dolomite Products Co., Maple Grove, Ohio, is erecting an extensive plant for the production of a full line of limestone products including some new lines that are very interesting. A process has been devised by which a substitute for magnesite for refractory purposes is produced from dolomite rock. Very extensive experimentations conducted upon a large scale have demonstrated the fact that the substitute dolomitic magnesia is as good or superior to the magnesium oxide which heretofore has been imported for all sorts of refractory purposes from the Austrian magnesite deposits.

The plant now under construction is 426 feet long and 80 feet wide, and is constructed entirely of concrete and steel. It will be equipped with two rotary kilns nine feet in diameter and 165 feet long. The burning will be done with producer gas. There are also four large rotary driers, two tube mills and an elaborate system of separating screens. Large storage bins for storing the unfinished material are also a part of the plant.

It is estimated that the plant will cost about \$200,000 and it is expected to have the first section in operation by July 1, and the whole plant completed by Sept. 1. The entire plant will be operated by electric motors, each machine having an individual motor to drive it, the juice being furnished by the Ohio Light & Power Co., which has installed a special line for the purpose.

In addition to magnesia the Dolomite Products Co., will produce ground limestone, and crushed rock upon a very large scale.

The Eastern Lime Market.

It is gratifying to observe of late, a marked improvement in demand for building lime throughout most of the eastern sales districts. Some plants are behind in their shipments of this product, and the outlook is for a still greater demand with the return of settled spring weather. Agricultural lime demand continues heavy in all lime manufacturing districts, many producers advising the largest sales for this product they have ever experienced. General demand at all eastern lime plants is good, and capacity operation prevails at practically all of them. The condition of kiln operation on April 17, at seventeen eastern plants reporting 141 kilns, showed that 133 kilns were in operation and eight out for lack of orders.

In the Virginia district, building demand shows improvement with a number of plants behind in their shipments of this product. Demand a month ago was somewhat affected unfavorably by the advance in the price of this product by a number of plants of this district, but this condition does not prevail at this time, for most plants are taxed to the limit in filling building lime orders. Agricultural lime is also moving rapidly in the Virginia district, and the outlook is for a better-than-normal output this year. In the West Virginia district, a continued good demand exists for all products, and plants are operating at kiln capacity. Reports from the Maryland district show an unusually heavy demand for agricultural lime, a number of plants advising an oversold condition. This demand should continue for some time, in view of the lateness of the season in this section. Weather has been bad for soil liming, and farmers are behind in the preparation of their land. In the Pennsylvania district,

agricultural demand is showing greater activity and a rapid improvement in the demand for bulk lime is reported by several plants. The greatest demand ever experienced for agricultural lime, is shown by the report of one manufacturer of this district, who also advises other lime trade as being very strong. Building lime output in the Pennsylvania district is fair to good, with the outlook for an improvement in the demand for this product as weather conditions become more settled. In the New England district, general trade conditions are better, and the demand for finishing lime is particularly good. Although business is good in New England, lime producers are not experiencing any particular boom or rush. Conditions might be termed about normal at this writing. There is a very good agricultural lime demand in the New England district which, it is expected, will hold well for the next two months.

To Standardize the Lime Barrel.

A bill to standardize the barrel of lime was introduced on April 6, in the House of Representatives by Congressman Hay, of Virginia, and the same bill was also presented in the senate on April 8, by Senator Clapp, of Minnesota. Both bills have been referred to the respective house and senate committees in charge of all legislation dealing with standards, weights, and measures.

This bill, known as H. R. 14298 and Senate No. 5425, is the result of the action taken by the National Lime Manufacturers' Association at its meeting in Cleveland, February last, at which time a resolution was adopted providing for a standard large and small barrel for lime, to hold one hundred and eighty pounds, and two hundred and eighty pounds, net weight, respectively. The bill, therefore, has already received the approval of an association of lime manufacturers representing a large majority of the industry. Further than providing for a guaranteed net weight of lime in both of the barrel packages, the bill also requires that in the sale of lime in quantities of more than one barrel and where barrels are used merely as containers in making delivery, that each such barrel will not necessarily have to contain the net weights provided for in the act. Nevertheless, the local dealer or jobber will be required by the act to deliver a total weight equivalent to the total weight of the number of large or small barrels represented, sold, or charged for by him in fulfillment of the order. However, when a local dealer or jobber barrels lime and sells it in the headed and branded barrel, he is required to comply with the full provisions governing the standards weights of each package.

The object of this bill is to provide relief to the lime manufacturers who are subject to the Standard Barrel Act, effective from and after July 1, 1916, and which covers the commodity, lime. The barrel provided for in the latter act is of the dimensions, length of staves, twenty-eight and one-half inches; diameter of heads, seventeen and one-eighth inches; capacity, seven thousand and fifty-six cubic inches, which, from the discussions of lime manufacturers, would be wholly unadaptable for the industry, and would work a severe hardship if such a size barrel were required to be used. On this account, in order to legalize a special barrel for the lime industry, it was deemed necessary to have special legislation of a nature and scope that would provide needed relief to the lime manufacturers, and at the

same time comply with the objects and purposes of the Standard Barrel Law.

This Lime Barrel Bill, of course, must become a law prior to July 1, 1916, otherwise the barrel lime producers will be subject to the provisions of the objectionable Standard Barrel Act, effective on the latter date. With the unanimous approval given the measure by the membership of the National Lime Manufacturers' Association, the passage of the bill should be merely a matter of routine, however, with the present rush of congress the bill might not be called up unless interest is manifested in it, and attention called to it by the barrel lime manufacturers.

The Standard Lime Barrel Act as introduced in congress, follows:

A BILL

To Standardize the Barrel of Lime.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby established a large and a small barrel of lime, the large barrel to consist of 280 pounds and the small barrel to consist of 180 pounds, net weight.

Sec. 2. That when lime is sold in barrels the words "large barrel, 280 pounds" or "small barrel, 180 pounds" shall be stenciled or otherwise clearly and permanently marked upon one or both heads, and in addition the name of the manufacturer of the lime and the name of the brand, if any, under which it is sold: Provided, however, that when a jobber or local dealer in lime sells lime in quantities of more than one barrel and delivers it in barrels which are not headed and are used merely as containers, then nothing in this act shall be deemed to require that the barrels be marked as provided in this section or that each individual barrel contain either of the standard weights established in section one, but he shall nevertheless deliver a total weight equivalent to the total weight of the number of large or small barrels represented, sold, or charged for by him, or purported to be delivered by him pursuant to an order.

Sec. 3. That rules and regulations for the enforcement of this act, not inconsistent with the provisions of the act, shall be made by the director of the Bureau of Standards and approved by the secretary of commerce, and that such rules and regulations shall include reasonable variations or tolerances which may be allowed.

Sec. 4. That it shall be unlawful to pack, or to sell, offer, or expose for sale any other barrels of lime than those established in section one; or to pack, or to sell, offer or expose for sale any barrels of lime which are not marked as provided in section two; or to represent, sell, charge for, or purport to deliver as a large or small barrel of lime any less weight of lime than is established in section one, for a large or a small barrel, respectively; and any person guilty of a violation of any of the provisions of this act shall be deemed guilty of a misdemeanor and be liable to a fine not to exceed \$500, or imprisonment not to exceed six months, in the court of the United States having jurisdiction.

Sec. 5. That prosecutions for offenses under this act may be begun upon complaint of local sealers of weights and measures or other officers of the several states and territories appointed to enforce the laws of the several states or territories, respectively, relating to weights and measures.

Sec. 6. That this act shall be in force and effect from and after the first day of July, 1916.

Chalk limestone is said to have been discovered on the farm of ex-Sheriff E. H. Ransom at Avalon, Wis., near Janesville, Wis. Mr. Ransom sent samples of the rock to the Wisconsin Agricultural Experiment station at Madison and also to a Milwaukee concern and in both cases the test showed the rock to be 98 per cent pure or better. The quarry will furnish a large quantity of rock as it is about three or four acres in extent. The face of the quarry is now about twelve to fifteen feet in depth and will be considerably deeper when the top of the knoll is reached. How deep the vein of rock extends is not known.

Southern States Lime Co., Kingston, Tenn.; capital, \$50,000; incorporators, J. N. Derriek and Hester Waller.

With the QUARRIES

Outlook for Business Never Better.

Speaking in general terms, the crushing industry was never in a better state of preparedness at the beginning of the season than it is at the present time. A great deal of new and improved equipment has been put in, and in a number of cases extensive outside storage has been provided to improve the commercial condition of the plants, in line with the intelligent discussions that were conducted in these columns last summer and fall. In short, the subject of equipment is being given the fullest consideration by crusher men who recognize that the shortage of quarry labor is a condition that can be met in no other way. A great many of the crushers have already started into full operation, and many others are still conducting extensive pumping operations to clear the deep pits of water, and some are pumping and operating at the same time.

The demand for road stone for the construction of macadam roads as well as for concrete roads is very large, so that for the most part the output of the crushers is pretty well taken care of.

The suggestion of a ten per cent advance over last year's prices for commercial stone has met with widespread approval, and will doubtless be effective fairly universally. In spite of the steadily advancing cost of the operation of the quarry and the crushing plant, last year there were many cases in which commercial stone was sold at a lower figure than it ever was before. No such thing will be possible this year, unless the producer calmly and systematically decides to pay the deficit of such quotations out of the meager earnings that he received from big contracts.

In view of all the circumstances surrounding the cost of quarrying and operating a crusher plant in this year of 1916, it will be necessary to quote an advance of ten per cent over last year's prices in order to come out with a whole hide. Every customer is expecting just such a condition, and they will be prepared to meet it, and will really be surprised if the advance is not quoted. In fact, a ten per cent advance in very many localities will not be a sufficient figure, and fifteen or even twenty per cent advance will be necessary.

These things are well recognized, for the advanced cost of operation has to be taken into consideration in making the selling price. There is no doubt that such precautions of sound business practice will have little difficulty in finding general adoption everywhere except in the big city markets where the buyers surround themselves with all the arts and practices of mystery that are known in the trickery of business. They play the spider and the fly game to the queen's taste. Sometimes several city buyers pool their interests and work in cahoots so as to squeeze and grind down the crusher man to the last cent that he is willing to take for a part of his product, and then by delay and the withholding of delivery orders tie him up for demurrage or hold him up for tribute in order to get a steady line of deliveries.

All of this unravels itself a little later on when the volume of the season's business begins to take up the full capacity of the crusher. It is only at the beginning of the season that it is possible for these fellows to play both ends against the middle, for along about the time that everybody is running their plants to capacity these same fellows lose their dignity and cast aside all their mystery and chase after every car and every wagon that arrives

in a free-for-all scramble to get the material that they are bound to have. When they want it they want it quick. There is nothing that they get so impatient about as the deliveries of crushed rock when all the plants are running at maximum capacity. But even in this condition, and through it all, they have usually got the price in control by contracts taken early in the spring when the crusher man was trying to sell and they knew it was going to be several weeks before they needed deliveries.

If the operators supplying their material in the big city markets could only hold their breath and make their spirits rest in patience until Mr. Buyer really wants the material, they would not have to start in the midst of demoralization and work for half the season to get out of the hole that they got squeezed into by the tricky tactics of the come-on system previous to starting up.

On the whole, we are led to believe that there has been less of the destructive kind of contracting in anticipation of the demand in the big city markets, which promises well for the prosperity of the crusher man during the coming season. If this is really true, it means that 1916, now just getting active upon a big scale, is to be the most profitable year that the crushed rock producers have ever known.

The Old Plan Suggests a New One.

Governor Brumbaugh, of Pennsylvania, recently issued the annual proclamation fixing Thursday, May 25, as Good Roads Day throughout the state. According to the official figures of the Pennsylvania Highway Department, upon this occasion last year 76,996 men and 13,500 teams gave a day's work to road work and these were distributed over about 6,000 miles of road. The Good Roads Day referred to is an ancient custom that has long been established in the older states and has steadily been kept up in a few of them, Pennsylvania amongst the rest.

The old time custom was for every able-bodied man living in the rural districts to give one day's work to the repairing of the roads immediately after the frost came out of the ground, so that they would be fit for use during the coming summer. In some states in former times, notably in Kentucky, all of those who failed to serve for one day's work on Good Roads Day was subjected to a poll tax of \$1.50, which was used by the sheriff to pay for a man regularly employed to keep up road repairs. This was charged so that all those who failed or refused to repair the roads could not vote until they paid the penalty of the wages of a road worker for one day. It was a good idea of the pioneers and accomplished a whole lot of good and doubtless those states that still keep up the old custom derive very material benefits from the universal response to the call of the governor to make the roads more passable.

Outside of Pennsylvania there are thousands of miles of road that would not be injured by having a survival of the old-fashioned Good Roads Day installed. There is a great deal of concentration in these days on the subject of roads, and in the last decade more dependable knowledge has been developed than in all previous history, but that does not seriously help the thousands upon thousands of miles of highway in this country which are little more than streaks of mud, reaching from city to city, through villages and hamlets that are almost

as isolated for a large part of the year as if they were located in the polar regions or the uttermost islands of the sea. This condition exists not in the far-away Rocky Mountains or in Alaska, the Philippines or any other remote place, but ten, fifteen and twenty miles out from the biggest cities of the world, in counties whose assets are estimated at hundreds of millions. In fact, just such a description of roads can be found anywhere within a radius of ten miles that one may be located in these United States, with very few prominent exceptions.

The full improvement of well made, perfectly graded and surfaced roads of any kind will not reach all of these emergencies even at the present enormous rate at which road mileage is being constructed in two hundred years. Just a little crushed rock would be a tremendous palative remedy to the almost universal distress. Four inches of rock spread eight feet wide should not be a very expensive treatment in these days of quick, autotruck delivery, and yet it would mean the difference between possible and impossible communications that would very promptly lead up to further road improvements and so constitute a hatchery for good road mileage to be made of the most approved types in a few years' time. The taste of a little improvement of this kind would amount to a tremendous incentive, and plant the seed of hope in the bosoms of those who have long-considered their cases hopeless. At least some very rich county could afford to make such an experiment if the people who are interested in good roads would give this suggestion a definite boost. It is in line with the old idea of the universally applied "Good Roads Day."

EXTENSIVE ADDITIONS TO EQUIPMENT.

Maple Grove, Ohio, April 17.—George W. Patnoe, general manager of the Dolomite Products Co., the newly organized successor of the Holran Stone Co., recently said: "As usual, we are getting our share of the business, and are sufficiently busy to keep out of mischief. Shipments of fifty to sixty cars per day are beginning, with prospects of increasing as the season opens. Our concern recently contracted for a considerable line of equipment to increase the capacity of the crushing plant by about fifty per cent. This machinery is to be installed as fast as it can be delivered and erected, some of the foundations already being in place. We expect to have the additional equipment in operation in July. The additions consist of a No. 10 McCully crusher, one 54"x24" Superior rolls, two 36"x16" Superior rolls, a 48"x85' elevator, two 5'x24' revolving screens, two 4'x16' revolving screens, two 48"x12' shaking screens, with all necessary storage bins and other buildings besides the connecting and driving equipment appertaining thereto. All of this new equipment will be electrically driven identically with the original plant, the electric current being furnished by the Ohio Light & Power Co. We are also erecting an extensive plant for calcining dolomite and manufacturing other limestone products."

Virginia Limestone Corporation, Ripplemead, Va.; capital, \$20,000; incorporators, Charles A. Klotz, 29 South LaSalle street, Chicago, Ill.

Joplin Crushed Flints Co., Joplin, Mo.; capital, \$10,000; incorporators, J. R. Hammond and others.

Largest Screen Ever Built.

The screening feature of rock crushing operations is one of the most important divisions of the plant. We very often encounter the term "broken stone" or "cracked rock." These are obsolete holdover terms from that period before the rock crusher was introduced in which pieces of stone were actually broken or cracked apart with a hammer to produce road metal and all of the other quarry products. The invention of the rock crusher brought about a new condition. At first the product, which we now call "crusher run" was used as it came from a simple spout beneath the pair of crushing jaws or the circular throat of the machine operating with vibrating head. But, very soon it was found that the crusher produced an infinite number of sizes, all the way from fine dust to the largest diameters of broken stone that were already familiar as road metal and as ballast for the early railroad operations as well as flux for the new furnaces that were operated for the reduction of iron ore to pig.

The screen was first introduced in order to separate from the crusher run those sizes that were recognized as broken stone in long established specifications, and all of the material not included in these specifications was considered as tailings and waste. Huge piles of such material accumulated close to every crusher in operation, and these piles became the one great problem for sustaining

having the widest meshes made the final rejection of big stuff. This was the *modus operandi* employed in separating the material used in the concrete for the first tunnel job under the Chicago river more than forty years ago.

The same kind of a process is said to have been used by the engineers of the Illinois and Michigan canal nearly sixty years ago when they were laying the natural cement footing for the masonry work at the southern terminus of the canal at LaSalle. Possibly the same method was used in many other places.

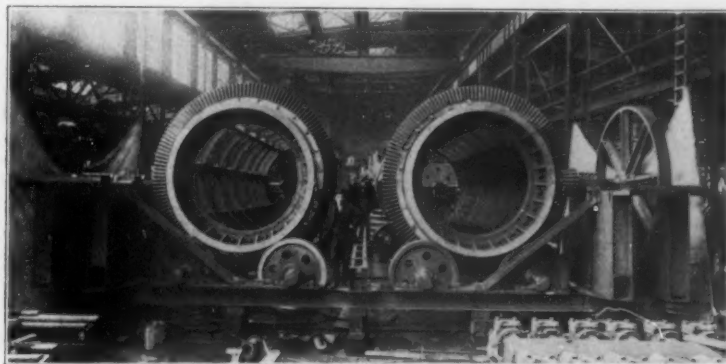
Among the first attempts at commercial separating was that done by the late Edwin Walker at Lemont, Ill. He took the same screens so mentioned and placed them one over the other in a wooden frame that resembled a tower. The screen frames were all pitched to an angle of about 60 degrees and the material that came from the crusher was hauled by carts up an incline and dumped upon the top screen. It then passed over by gravity one screen after another, the meshes of each screen always passing the smallest size and rejecting all larger sizes. The team feature of this outfit was abandoned very promptly, and an elevator belt, similar to that used in grain elevators was introduced. This was probably the first application of an elevator belt to the screening process. The whole outfit was only a temporary operation, because Edwin Walker was a great contractor in his time, and he only made sufficient materials of the sizes specified to meet the requirements of a con-

ment of what is now known as the "cylindrical screen." The same kind of a steel plate with punchings are fastened to a frame so as to form a cylinder. The small openings are always at the end into which the crusher run material is fed by the elevator and the largest opening is placed at the other end which passes the final separation and rejects the oversize. Between the smallest and the largest screen openings intermediate sizes are arranged in rotation. Thus the separating screen of a rock crusher was at first the adaptation of the same principle used in other industries after a suggestion of its efficiency had been worked out in practice.

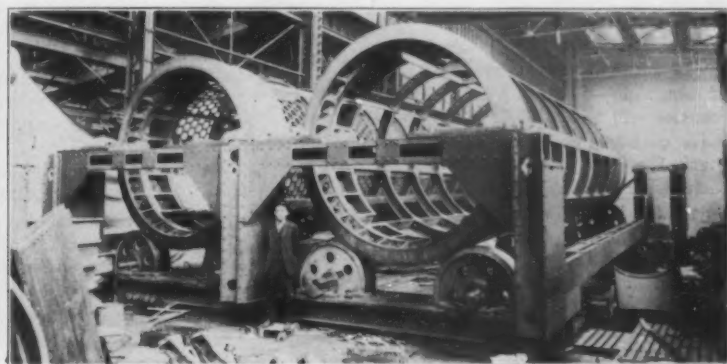
There have been improvements and refinements in the construction of screens and various formulae have been worked out for the speed of its rotation. Some have been worked dry and others have introduced water so as to wash the material through the screen, and various and sundry special requirements have been tried out.

Some of these were quickly abandoned, while others have made good and become the standard practice for certain purposes. The screening division of the crusher plant has come to be the one that requires a great deal of skill, some very nicely adjusted machinery and considerable study to obtain the full measure of economy that can be produced in the process.

Big outputs require big screens, and perhaps no man knows at this time the limit of the size which will be found as the most economical for handling



INTAKE END OF SCREENS.
THE LARGEST PAIR OF SEPARATING SCREENS EVER BUILT.



DISCHARGING END OF SCREENS.

a crusher operation. There are old records which show that crusher plants had to be abandoned or moved to a new location because they were literally choked out of existence by the accumulation of tailings and screenings. A great deal of this material in early times was loaded out free in order to relieve the pressure and make room for more of the same kind of stuff which has always represented nearly half of the product of the crusher. In the early days of crushing operations, and when the separating screen was in its crudest state, railroads secured immense tonnages for nothing, which they used for filling. The crusher man was always glad to get rid of it in order to be able to produce that portion of his product that was marketable. But now that early problem of the crusher business has become the tail that wags the dog. Tailings is a long forgotten term in connection with the rock crusher. The fine material at first considered useless as so much dust, is now in most request, and in very many localities brings a much higher price than any other portion of the crusher's output.

The separating of the crusher product into sizes to meet the requirements of practical specifications has been one of the most interesting developments. The very first thing that was ever used was a number of wire screens fastened to an inclined frame each having a different sized mesh. Then a man stood in front of each screen and literally shoveled the material as it came from the crusher against the screen. The second man shoveling the same material against his screen and so on until the screen

tract that he was fulfilling in the city of Chicago at the time.

The man who built and operated this initial screening outfit for Walker says that it worked all right for the purpose for which they needed it, but that it was expensive for the reason that all the heavy stuff was dropped by the elevator upon the finest screen, which of necessity had to be made of small wires, and consequently wore out quickly. The biggest screens near the bottom of the operation stood up all right, but the top fine screen, having meshes about three-quarters of an inch would wear out twice a day, the second one, having meshes about an inch and a half would only last a day or two.

About two years after this first attempt the same outfit was used again to produce the material for another job, and the top screens were made of flat sheets of steel having round punchings, very much like the punchings that are used in the circular screen now so familiar to every crusher operator. The punched plates came from Milwaukee and there was a small boat load of them, because it was anticipated that they would wear out nearly as rapidly as the wire screen had done. But this proved not to be the case for one fine screen placed at the top lasted all summer, and some twenty-five or more sets of spare punchings were never put upon the frame, and were sold for junk last fall without ever being used.

Cylindrical separators were already in use in milling processes and with the suggestion of the elevator belt it was only a step to the develop-

big outputs. The largest separating screens that were ever built have been constructed during the past winter at the great shops of the Power and Mining Machinery Co., at Cudahy, Wis. Photographic reproductions of this great pair of screens, weighing 270,000 pounds, are illustrated herewith. The screens are each nine feet in diameter on the inside of the plates, and the cylinders are thirty-two feet long measured upon the screening surface. It is another of the big engineering achievements of Lew J. Hewes, the Chicago manager of the Power and Mining Machinery Co., who worked out this big screening machine in connection with the engineers of an industrial concern. Of course, the capacity of such a pair of screens can only be estimated at 15,000 tons per day.

This pair of screens is equipped for operation by electric power, and is to be the initial set of an extensive separating and screening outfit in which the material fed by chutes from the screen is re-screened again in smaller cylinder screens on levels below the big pan. One reason why two screens are employed in this design is the limitation of feeding the crusher run material which is done by means of two immense belt elevators. The elevating system in connection with these screens really constitutes an interesting engineering problem, which naturally cannot be illustrated at this time owing to the fact that as yet it has not been installed and put into operation. The accompanying photographs, however, give our readers some idea of the largest pair of separating screens that were ever designed or constructed.

CONDITIONS NEVER LOOKED BRIGHTER.

Toledo, Ohio, April 15.—L. H. Hawblitz, of the France Stone Co., speaking of the season's outlook, says:

"In Ohio, Indiana and Michigan the demands for crushed limestone for the year 1916 will be, beyond a doubt, far greater than any previous year. The sentiment for the various types of macadam road improvements is spreading like wildfire, and petitions for macadam road improvements are being circulated continuously, and filed with the proper road officials. While there is still considerable sentiment in some places for the construction of the rigid monolithic type of road, costing from fifteen to twenty thousand dollars per mile, yet this sentiment is not sufficiently strong to warrant any particular uneasiness on the part of the stone producer.

"When the official action of our road building officials is taken into consideration, and an investigation made, it will prove that there will be three or four times the mileage of the macadam type road laid in Indiana, Ohio and Michigan as compared to the mileage of brick and concrete and all other types.

"Earlier in the year considerable apprehension was felt regarding the possibility of a car shortage, but as the season begins to open up, we believe that this feeling was premature.

"If weather conditions are favorable and we are not visited with such excessive rains as we had in 1915, we can not help but feel that the outlook for the stone business was never better in its history.

"In a recent canvass made of fifty-one counties of the eighty-eight in Ohio, we learn that these counties will build 469.22 miles of macadam, 78.84 miles of brick and 22.87 miles of concrete. The State Highway Department will construct under their supervision 195.47 miles of macadam, 81.90 miles of brick and 43.55 of concrete.

"Another thing in favor of the product of the crusher is the fact that our public officials, as well as a great majority of our private citizens, are becoming educated along the lines of road improvements and the best types to select. Our best engineers and road builders all agree that with the proper maintenance (which all roads must receive) the macadam type road is the most economical in the long run. With the above facts before us conditions never looked brighter for the stone producer than they do at the present time."

CINCINNATI TO HAVE NEW PLANT.

Contracts have been let by the Queen City Crushed Stone & Sand Co., a new concern organized by James M. Sprague and others at Cincinnati, Ohio, for the construction of a crushed stone and sand plant to cost \$50,000. The plant will be built on the Pennsylvania railroad at D. Y. Tower, near the city, on a tract of 135 acres controlled by Mr. Sprague. The other officers of the company are Jos. Ertel, vice-president; O. K. Jones, secretary, and T. F. Groves, treasurer.

RECOMMENDS EARLY ADVANCE OF PRICE.

J. F. Talbot, president of the Dolese & Shepard Co., Chicago, says their plants have been operated the entire winter, and while the demand is small in that period, yet it was much larger than the year 1915. Prospects seem to favor a good year, but, notwithstanding every commodity has advanced in price, crushed stone is selling much lower than in previous years. Labor is hard to get at wages in excess of a year ago. Dynamite, coal, oil, steel, in fact everything used around the plant is costing much more than formerly and should cause an early advance in the price.

HAS INSTALLED EXTENSION STORAGE.

East St. Louis, Ill., April 16.—J. W. Stolle, secretary of the Caspar Stolle Quarry & Contracting Co., in speaking of prospects, said: "As I look at it, there is every reason to believe that we will have a big summer demand. In my opinion the railroads will buy ballast more extensively than they have been doing in recent years, but general building conditions in our territory so far are very poor. I quite agree with your editorial to the effect that the price on crushed stone should be advanced. We sold crushed stone last year at a lower price than any other year in our experience for a while during the depression. The advanced prices on explosives, repairs, coal and supplies have advanced the cost and the prices should be advanced at least ten per cent on all kinds of material. We recently completed an extensive ground storage to take care of 60,000 yards of material in addition to our forty-car bin capacity and I am doing all I can to advance prices by storing material, rather than moving it by slaughtering the price.

WORKING OVERTIME WITH INCREASED CAPACITY.

Youngstown, Ohio, April 18.—C. C. Blair, general manager of the Bessemer Limestone Co., says: "We appreciate your stand on the price-cutting proposition on deliveries for crushed rock for the current year. We are running our plant to full capacity and working overtime. We are unable to keep up with our orders. We recently installed an Allis Chalmers No. 24 gyratory crusher to increase the capacity of our operations. We do not see why there should be any reason for low prices this season."

ANY FOOL CAN CUT PRICES.

Cape Girardeau, Mo., April 18.—Edward Hely, the veteran crusher man of the Mississippi valley, says: "The season's business is starting off very good, and I expect to be busy all the year. During the dull times of January and February I put everything about the plant in good repair so as to avoid delays during the busy season. I read with interest your editorial on the subject of cutting prices. I cannot see how any crusher man who knows his business should be cutting prices. My experience has been that any fool can cut prices, while all the wise men in the land cannot get them up again. An experienced crusher man knows what it costs to do work and to keep up an organization and plant in good repair, but to people who do not understand these things the crushing business looks so good that there is always a butcher or a baker getting into the good thing and cutting the price. I consider that the price of crushed rock has been low enough or too low for a number of years."

KENTUCKY QUARRIES BUSY.

Louisville, Ky., April 19.—There is much activity at this time in the quarrying and rock crushing circles. Road work in Kentucky, which will be unprecedentedly extensive this year, has already begun and practically every stone and rock producing plant in the section is now or shortly will be extremely busy.

The Stephensburg Stone Co., Stephensburg, Ky., has taken the contract to supply Jefferson county, Ky., with 11,000 yards of rock at \$24,000, the contract including crushing and hauling the rock and placing it on the road.

At Liberty, Ky., there has been a company organized by J. C. Lay, C. A. Lay and others to quarry and crush limestone. Pulverized stone for fertilizing purposes will be a feature of the work and will be sold at the mills at \$1.75 per ton.

The Kentucky Lithograph Stone Co. has provided its quarry with machinery for pulverizing limestone and also machinery for manufacturing grit for chickens. The Meade county limestone is said to be unexcelled for the purpose. The company has elected R. T. Durrett, Jr., president, J. C. Hood vice-president, and H. P. Lewman secretary and treasurer.

S. H. Rutledge and W. P. Moberly have recently purchased from the Louisville & Nashville Railroad company a valuable limestone quarry about six miles east of Winchester, Ky. There are about twenty acres in the purchase and the formation is a superior grade of limestone, suitable for building and monument work. The quarry is on the new Winchester-Irvine extension of the railroad and the ledge runs from four to twelve inches in thickness, the beds being smooth.

James Hartlage, John W. Hartlage and J. Frank More have incorporated the Stephensburg Stone Co., which will operate a stone crushing plant at Stephensburg, west of Louisville, Ky., on the Illinois Central railroad. The mill is now in operation and will provide material for use in building roads in the vicinity. The company has \$15,000 capital.

The Athens Stone Co., Olive Hill, Ky., is adding a 300-horsepower engine to the plant and generally overhauling the equipment. Mr. Moberly is quoted as saying that the outlook for a busy year was never brighter.

LOOKS LIKE A GOOD START.

Greencastle, Ind., April 20.—E. B. Taylor, president of the Indiana Crushed Stone Association and manager of the A. & C. Stone & Lime Co., says: "It looks like there will be a fairly brisk demand for crushed rock this summer. However, the road contractors have been slow to start their work on account of spring weather conditions. Prices are not as high as they should be when one takes into consideration the great advances in all the materials and supplies that we use to manufacture crushed rock."

RAUSCHER REPORTS GOOD DEMAND.

E. W. Rauscher, of Erin, Tenn., reports a better activity in the lime trade and his kilns are active.

The Hutchinson Co., extensive handler of crushed rock and other materials in Oakland, Cal., has bought a site in that city and will shortly erect a building.

The Prince-Johnson Crusher Co., of Kansas City, Mo., has been enjoying business quite up to the normal mark so far this spring. While no large work has opened up, there has been a good run of trade, and the crushers have been kept going at capacity normal for the season. The relief over the postponement of the proposed increase in freight rates has been an appreciable factor in the satisfaction with the business.

The Limestone Products Co., of Chattanooga, Tenn., is seeking to take to the Court of Appeals the case in which Hamilton county seeks to condemn a right-of-way through its property. It holds that the county already owns a right-of-way connecting the two objective points, Wauhatchie and St. Elmo. It declares that this right-of-way is parallel with the one wanted for the new pike.

The common council of New London, Wis., has awarded to H. Ebbe, of Waupaca, Wis., the contract to furnish 3,000 yards of crushed stone and the sand and gravel needed by the city during the present season.

Virginia Railway, H. Fernstrom, chief engineer, Norfolk, Va., will erect a \$100,000 rock crushing plant at Ripplemead, Va.

SAND and GRAVEL

High Waters Handicap Sand Production

This is the season of the year when sand and gravel producers who dredge their material from the beds of rivers find themselves handicapped in producing this material for the trade by rapidly rising waters. The high waters of the Ohio and the Mississippi rivers, which are annually a source of much worry to industries located upon their banks, naturally present problems which men engaged in the digging of sand and gravel not only have to confront but, in order to supply the early demand of the retail and contracting trades, must overcome.

The melting of snow in head waters in the early spring has usually been the cause of the rise in these waters, but of late years the clearing of timber from districts adjacent to these rivers and the use of tile in draining farm lands has materially augmented the flow of water. During the months of March and April—the season of heavy rainstorms—the land is drained in about twenty-four hours' time and in the district of Portsmouth, Ohio, New Albany and Evansville, Ind., this water finds its way to the Ohio river. At points in the Ohio river the water has risen this year to a height of forty feet on the government marks.

The H. H. Halliday Sand Co., whose dredges operate in the vicinity where the Ohio and Mississippi rivers join, has often been faced with the problem of high waters and is now little effected by what, in past years, has been a menace and a serious handicap. According to H. H. Halliday, the plant is now so equipped that it makes little difference whether the firm pumps in six or sixty feet of water. "We do not stop operations on account of the stage of the rivers, high or low," says Mr. Halliday. The annual spring floods have long since passed the Cairo district and are now out of the way.

The experiences of other producers during the past few weeks follow:

E. T. Slider, New Albany, Ind.: "We have been shut down for ten days on account of high water, but we expect to begin digging again in a few days. For a while we were compelled to dig in sixty feet of water. Due to the fact that timber has been cleared very fast recently and a great part of the land is now drained with tile, our river rises much faster than it used to. High waters have no effect on the selling end of our business. It simply shuts off the producing end."

The Scioto Sand Co., Portsmouth, Ohio: "There has been quite a good deal of high water this winter and spring but up until two or three weeks ago it did not seriously curtail our sales, as trade is always light at this time of the year and we had a great deal of materials stored. However, for ten days previous to the week commencing April 9, the water was so deep over our sand bar that the plant could not be operated at all, and we ran short on materials. Heavy and frequent rains have caused the high water. We have been in operation since April 10 and have plenty of sand and gravel at this time."

Bert Koenig, superintendent Evansville Sand & Gravel Co., Inc., Evansville, Ind.: "The sand and gravel dealers of Evansville have been rather fortunate during the recent high water about pumping their material. There is a sand and gravel bar

situated directly across the river, on the Kentucky side of the river, on which the sand companies can dig in forty feet of water. While the pumping is rather slow, and the gravel not as good as in a normal stage of water, they pump enough material to supply their needs at this time of the season. The Evansville Sand & Gravel Co. is better equipped than the other two companies to do their loading during high water. Their derrick is so situated as to let them store several thousand yards on either side of their hoppers, which is picked up by the derrick, placed in the hopper and run out to the railroad cars and their wagon hoppers, which help to keep them from trying to pump during the high water, and also gives them a good grade of sand and gravel. The water situation in the Evansville district has been so uncertain and irregular that it is almost impossible for them to figure on the stage. Their account of having so much water is that the farmers of today are all tiling their farms, which lets all the water get to the rivers faster than before. They expect the water to recede now until the June rise, which comes yearly."

N. H. Battjes, general manager of Standard Builders' Supply Co., Grand Rapids, Mich.: "For reason of high water our plant has not yet been started, but we believe we will be ready to begin operations in a few days. We have just installed large gravel screens and washers."

C. E. Todd, secretary-treasurer of The Kaw River Sand & Material Co., Kansas City, Mo.: "We have temporarily been compelled to suspend business owing to the damage to our pump boat in the ice dam the latter part of February. We have recently resumed operation, however. In February an ice gorge piled up against the dredging boat twelve feet high and capsized the boat. The river rose twelve feet immediately afterwards, and filled the wreck with sand, also impeding salvage. The machinery was all recovered. A tent was erected at once, and a new boat built under it, which was completed, equipped and put into operation about the first of April. Most of the month of March was inclement, so little business was lost but the latter few days were pleasant, and the company had to scramble to get sand to fill contracts. The old boat will be raised and equipped, giving the company a large capacity. The capacity of the new boat is larger than that of the old one, due to changes in installing the old machinery, and the company is now able to care for orders of any magnitude. The company is providing storage capacity, both at the plant and elsewhere in the city, in order to take care of its trade at all stages of the river, and in all seasons of the year."

Jahncke Navigation Co., New Orleans, La.: "The high water has not affected our proposition at all. The only serious handicap that we have been up against here is the car shortage."

The Russellville Sand and Gravel Co., Russellville, Ark.; capital, \$2,500; incorporators, P. E. Reed, A. Bernard, J. G. Wilson and W. E. Myers.

The West Jersey Sand and Gravel Co., Camden, N. J.; capital, \$100,000; incorporators, J. Disbrow Baker, Joseph P. Murray and F. Stanley Souerman.

ANOTHER PRODUCER FAVORS TONNAGE BASIS.

Producers of sand and gravel in all parts of the country have been seriously considering the advisability of selling their product on a tonnage basis in preference to a yardage basis since the campaign with this object in view was started by ROCK PRODUCTS AND BUILDING MATERIALS. It has been the topic of conversation wherever sand and gravel men have congregated and numerous opinions have been forwarded to the office of this publication. Most of these were published in the last issue.

Since that time the Jahncke Navigation Co., of New Orleans, has gone on record through its secretary and treasurer, Walter F. Jahncke, as favoring the plan to sell material by the ton. Mr. Jahncke's remarks are as follows:

"Up to the present time our material has been sold on the yardage basis but it is our intention, if we can get the dealers together, to sell everything on the tonnage basis, as we believe it would be better for all parties concerned."

WARM WEATHER IMPROVES LOUISVILLE BUSINESS.

Louisville, Ky., April 19.—With arrival of settled and warm weather the Louisville sand and gravel companies are reporting increases in business. The river, which had reached rather a high stage, has now fallen and digging operations are being carried on handily. The steamer Northern, of the E. T. Slider Co., recently got a good deal of attention by a hard fight to stem the current at the falls. During high stages of the river the canal is closed and it is necessary for boats to go "over the falls." Here the current is swift and big boats like the Northern have difficulty in making the trip up. For several hours the attempt was made, the third attempt at length proving successful.

Hickman, Ky., reports that a sand bar in the Mississippi river which has been in evidence and on which builders largely relied for many years did not appear this year with the fall of the river. An unusually swift current is stated to have cut the bar to pieces.

The H. S. Piersel Sand Co. has been organized at Donora, Pa., to take over the entire fleet of the Keck Sand Co., of Morgantown, W. Va., which consists of the steamer "Mermaid," a sand digger, and several flats. The new company has the contract to furnish all the sand for the Charleroi plant of the Pittsburgh Plate Glass Co. The directors of the new company are as follows: H. S. Piersel and T. B. Hastings, of Charleroi, and E. B. Gribble, of Brownsville.

C. F. Pratt, manager of the Pratt Building Material Co., with headquarters in San Francisco, Cal., reports that the company has put in new bunkers and new screens at the plant at Marysville, Cal. He reports that the unusually heavy storms have brought down a great deal of gravel from the mountains, and that the quality is a great deal better than in previous years. Mr. Pratt says that his company has a lot of business in sight and that he looks for the year to be the best ever.

Structural Waterproofing and Dampproofing

BY R. ALFRED PLUMB.

General Director, Trus-Con Laboratories, Detroit, Mich.

The general subject of structural dampproofing and waterproofing as it confronts us today involves the methods and means of protecting structural materials against the disintegrating action of water. Masonry building materials are generally more or less porous and capillary in their structure, permitting the absorption and permeation of water. The presence of water in masonry is structurally injurious, due to its solvent action on any soluble content, but more particularly its disintegrating action by the expansive force that is manifested by the congealing of the water on freezing. Water that is drawn into foundations from the surrounding soil gradually ascends into the structure, due to the capillary nature of the constructive materials, and finally permeates the entire wall, producing damp and clammy conditions that foster and spread disease. While the subject of structural waterproofing and dampproofing deals primarily with the prevention of gradual decay and disintegration of structural materials, it also performs the useful and necessary function of providing more hygienic conditions for the benefit of humanity in general.

The subject of the protection of structural materials against the disintegrating action of water should, for the most comprehensive understanding, be considered under the two general divisions of waterproofing and dampproofing. The term waterproofing should correctly be confined to the consideration of methods and means of protecting subterra construction and structures intended for retaining and containing water under and against hydrostatic head. Consistent with this definition, the term waterproofing as a part of this great subject would apply directly to the methods of treating foundations, tunnels, reservoirs, cisterns, standpipes and similar construction. The term dampproofing should correctly be confined to the consideration of the methods and means of keeping water and dampness out of the superstructure of buildings. In accordance with this definition, dampproofing should involve the various methods of treating exposed walls above grade line to avoid the entrance or penetration of moisture and dampness into the structure.

While there is a slight opportunity for discussion on the absolute literal correctness of the above definitions, nevertheless this division of the general subject serves most admirably to differentiate between waterproofing conditions and dampproofing requirements and to qualify the various materials into either waterproofing or dampproofing products.

It was only a few years ago that in the absence of any comprehensive understanding of this subject, transparent washes were recommended in the literature of manufacturers for treating foundations, tunnels and general subterra construction, with no apparent recognition that such materials have absolutely no application to these severe requirements. By making the above separation of this general subject, and with further sub-division of each individual part, the various materials can be very simply classified and confined for treating conditions where they have a useful and valuable application.

In a paper from one of our larger universities, which recently appeared in the technical press, the following statement was included in the introductory remarks: "Waterproofing materials for use with concrete are divided into four general classes—membrane, integral, surface washes, and oil paint films." Such a statement can only be confusing, as it does not suggest or indicate any differentiation between the properties of the various materials which are suggested and is, in fact, no more progressive than the general understanding of the subject a few years ago when it was in a rather unfortunate and chaotic condition.

In the absence of a classification of this subject, it is very confusing to the engineer or architect to know exactly what material to select for any particular condition. Naturally, each particular product or method has some special properties that make it advantageous for certain conditions, and at the same time may have limitations that would correctly prohibit its use under certain requirements. Is it not advantageous to the development of this important subject to carefully consider the properties and behavior of each particular method, and so classify it as to be able to select the material and the method that best suit a certain fixed condition?

The architect or engineer will find the following classification of this subject a big advantage in preparing his specifications and also in his general consulting work. As an example: If a client should inquire whether a simple transparent wash was applicable for treating

the interior of a reservoir of considerable depth, he could very much simplify his reply with the advice that the method suggested by the client is fundamentally a dampproofing treatment and confined to conditions subjected only to dampness and has no application to a condition where hydrostatic pressure is to be withstood. The client can be easily made to recognize that his condition is literally a waterproofing requirement and that he must employ a method that has actual waterproofing value and not simply a material with such limitations as will only permit its use for dampproofing requirements.

Both the subject of dampproofing and of waterproofing can be sub-divided into various sub-headings, each of which has characteristic properties and insures quite a complete and comprehensive understanding of the full subject. The following discussion develops quite a full sub-classification of the two general subjects, with comment on the distinctive properties and values of each separate sub-class.

The subject of dampproofing, which we have already defined as correctly applying to a consideration of methods and means of keeping water and dampness out of the superstructure of buildings, may be very simply sub-divided into the three following classes, viz.:

- A—Transparent coatings and treatments.
- B—Opaque decorative coatings.
- C—Special bituminous coatings.

This classification is quite a complete one and includes practically every treatment that has ever been suggested or used to any practical extent in connection with the treatment of exterior exposed walls above grade line.

Again, the above classification of dampproofing treatments may be further sub-divided. The method involving the use of transparent coatings may be sub-divided into three quite characteristic sub-heads, viz.:

- (1)—The Sylvester process.
- (2)—Hot paraffine and waxes.
- (3)—Special proprietary products.

(1) The Sylvester process is one of the oldest dampproofing treatments, and while it has been used to some practical extent, it is at the present time very seldom considered. The Sylvester process provides for the alternate treatment of a porous masonry surface with solutions of soap and alum. These solutions are preferably applied hot so as to insure good penetration and to accelerate the chemical reaction between the two materials. The theory of this treatment is to provide by inter-reaction of the soap and the alum, an aluminum salt of the fat contained in the soap, which will be deposited in the pores of the surface and tend to repel the moisture. While from a theoretical standpoint the treatment may appear to be quite an effective one, yet on a practical consideration it is not very satisfactory. It is necessary to make a number of alternate applications of the soap and alum in order to obtain a sufficient quantity of the aluminum soap to provide any repellent or dampproofing action. The number of coats required is made necessary by the fact that the conditions of contact between the wash applications of soap and alum are not such as to insure a good, thorough chemical reaction between the two materials, and there is necessarily considerable soluble material left in the pores that is not utilized, due to the poor and inadequate physical contact.

(2) The second classification of transparent dampproofing treatments covers all of the various methods which have been proposed and used, involving the heating of the masonry surface and the application of melted paraffine or wax. While a dampproofing treatment of this type can be made very effective, its application is necessarily limited to only special cases where the high cost of its application is not prohibitory. The application can only be made slowly, as the surface has to be heated with a blow torch, and only when at the proper temperature can the melted paraffine or wax be applied to insure the proper penetration and absorption of the repellent material into the pores of the surface.

A very representative incident of the use of this method for preserving masonry exposed to weather exposure is the application to Cleopatra's Needle in Grand Central park, New York City, in 1885. This obelisk, while resisting the climatic exposure of old Egypt for ages, soon developed indications of rapid superficial decay when subjected to the climatic conditions characteristic of our country. The stone was quite absorbent, and as a result of the freezing of water in the pores the outer surface of the stone was

slowly disintegrating. In cleaning the obelisk previous to the application of the hot paraffine, about two and one-half barrels of pieces, weighing a total of nearly 780 pounds, were removed. Some of the pieces were so much decayed and disintegrated that they would crumble easily when removed from the surface. After removing the outer crust of disintegrated stone, the entire surface of about 270 square yards was heated and then immediately treated with a hot solution of paraffine.

(3) The third class of transparent treatments, viz., Special proprietary products, suggests quite an interesting and unfortunate chapter in the history of the development of the general subject of the preservation of structural work against the disintegrating action of water. Following the general recognition that one of the objections to concrete construction was its absorbent nature, there appeared on the market an almost innumerable number of transparent liquids presented with the most extraordinary and extravagant claims. According to the literature of the several manufacturers of these products, there was absolutely no condition associated with the general protection against water in constructional work that could not be very effectively and efficiently overcome by a simple application of their product. There was no intent or indication of a proper recognition of the limitations of a transparent treatment, but they were recommended without qualification for tunnels, foundations, reservoirs, tanks, etc., in fact, every single condition that would require waterproofing treatment would find the manufacturers of these transparent treatments recommending their materials.

It will always be the subject of a great deal of regret on the part of all who are vitally interested in the scientific development of this important subject that the manufacturers of these various transparent treatments did not exercise greater judgment in recognizing the limitations of their products. They were unfortunately prompted alone by the mercenary instinct of a quick return and profit on the sale of their material, not realizing that the ineffective and unsatisfactory results which would follow the use of their materials would tend to establish a general skepticism, and, in fact, disbelief in the efficiency and value of all waterproofing materials.

Practically all of the earlier proprietary transparent dampproofing products were nothing more or less than low melting point paraffines or waxes which had been melted and fluxed back into a volatile solvent. The theory of such a preparation is entirely correct, but unfortunately these several paraffines and waxes can only be dissolved in solvents to a very limited extent, producing a product that actually carries a very small amount of repellent base and an excessive amount of volatile material. On application to the surface, practically 90 to 95 per cent of the original material would be lost by evaporation, leaving only a small residue deposited in the pores of the surface. It would require a number of repeated applications in order to leave deposited in the pores of the surface a sufficient quantity of the repellent base to provide any efficient dampproofing results. Of course, it was usually recommended with these materials that two coats were all that was necessary in order to provide efficient dampproofing results.

There were a few materials that involved a little more technical effort than the simple solution of paraffine or waxes, but in the majority of cases only a small amount of actual total solids was introduced and not sufficient to impart any satisfactory dampproofing results to the surface over which they were applied.

The reason for not making more successful early progress on a transparent dampproofing treatment of this character is unquestionably the fact that the condition is by no means a simple one. A satisfactory transparent dampproofing material that is applied cold with a brush must be one that is practically colorless, as any tendency for the material to stain or discolor the surface is highly objectionable. Nature, unfortunately, has not provided many materials that offer possibilities for producing a product of this kind. The majority of products, when used in quantity sufficient to provide the necessary amount of total solids to give efficient dampproofing results, will impart such a color to the material that when used over stone that is more or less sensitive to discoloration, it will become badly stained, and the injury will be more serious than the difficulty which it was originally intended to overcome.

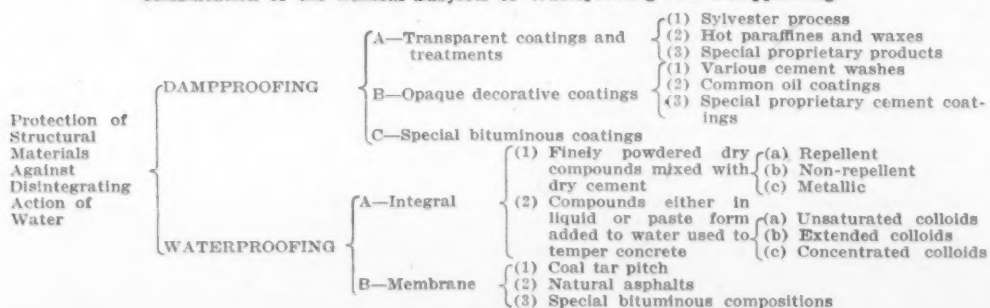
The repellent base held in solution in such transparent materials must also be of such a nature as will be more or less transparent after the volatile material has evaporated. This is an essential requirement, as the transparent treatments are used quite generally over porous brick or stone surfaces of various colors, and if the coating tends to leave a white deposit after evaporation of the volatile material, it will stand out in contrast to the colored masonry surface and appear as if the surface had a slight efflorescence.

The difficulties which the requirements for such a material presented, and the complaints which followed the use of so many of the inferior products, have resulted in the slow disappearance of a great number of products that originally appeared, and today there are only two or three of the materials on the market that were numbered originally among the great list of special products.

It is a problem that has involved a great deal of careful scientific investigation in order to select such materials which, due to their chemical affinity, can be so combined as to produce a synthetic base which has the properties of dissolving in the combination of solvents, to yield a product that will contain a comparatively high percentage of base so that when applied to a surface and the volatile material has evaporated, there will be a sufficient quantity of material deposited in the pores to fill them and change their natural absorbent nature to a negative repellent action.

B—The second class of general dampproofing treatments, viz., Opaque decorative coatings, may be sub-divided similarly to transparent treatments affording

Classification of the General Subjects of Waterproofing and Dampproofing.



a very simple consideration of this important part of the general subject of dampproofing. This classification is as follows:

- B—Opaque decorative coatings.
- (1)—Various cement washes.
- (2)—Common oil coatings.
- (3)—Special proprietary cement coatings.

(1) The first conception of applying an opaque decorative treatment is evidenced in the use of a mixture of cement and water applied with a brush for the dual purpose of obscuring any imperfections in the surface and giving an outer shell that is of a denser texture so as to protect the masonry from the penetration or absorption of moisture. While this treatment is more or less effective in uniforming the appearance of the surface, it hardly possesses any great or efficient damp-proofing results. This is due to the fact that the cement is mixed with water, and when applied the water occupies a definite volume, and on evaporation leaves the surface full of small microscopic pores and apertures through which water can penetrate.

There is also considerable trouble experienced in using a cement wash due to the difficulty in obtaining a satisfactory bond to the masonry surface if the material is not applied to concrete that has not fully hardened. The usual result with a cement wash is that the coating will be efficient for a little time but after having been subjected to frost when thoroughly wet and saturated it will be forced off from the surface by the expansion of the water on freezing, and any possible efficiency and value which it might originally have contributed entirely destroyed.

(2) The second class of opaque dampproofing treatments, viz., ordinary oil paints, has been tried at various times with unsatisfactory results. This is very obviously due to the fact that in contrast to a wood or metal surface, a concrete surface is chemically active, due to the presence of alkali. When a common oil paint is applied over wood or metal, there is no chemical influence to in any way interfere with its normal process of drying to a tough, elastic linoleum film. When such a product is applied over a concrete surface, the condition is distinctly different.

In the natural process of hydration of Portland cement there is developed approximately 37 per cent of calcium hydroxide. It is the presence of this calcium hydroxide that contributes a distinctive alkaline nature to concrete surfaces. Any drying oil, such as linseed, is easily decomposed when in contact with an alkali, tending to form a soap of the metal represented in the alkali. In accordance with this natural characteristic of a drying oil the calcium hydroxide reacts with the oil, forming a calcium soap which entirely destroys the characteristic toughness, elasticity and durability of the product. In place of a weather-resisting and preserving paint film, as would result if the material were applied over a wood or metal surface, only a sticky, incoherent, easily-perishing coating is left, presenting absolutely no dampproofing or uniforming effect.

Periodically we hear from various sources comment in regard to the use of lead and oil on concrete, which may be suggested by an occasional application that is more or less satisfactory. Actually, bitter experience has indicated that an oil paint is not adapted in its constituency to a concrete surface, and so long as a concrete surface is characterized by the presence of alkali—which, in fact, is an inseparable property—it will be impractical to attempt to use a product containing an oil that is so easily saponified.

Common oil paint is generally characterized by a glossy texture which is an objection for treating concrete surfaces. There is stability, strength and endurance associated with a masonry surface, and it is not consistent with good architectural treatment to apply an oil paint coating that will impart a glossy appearance so strongly contrasted to the naturally soft, flat texture of masonry surfaces.

(3) The third method of opaque dampproofing treatments, viz., specialized cement coatings, offers the greatest opportunity for producing effective and satisfactory dampproofing results. With a full knowledge of the physical and chemical characteristics of a concrete or masonry surface, it is possible to select raw materials and so treat and combine them as to produce a product that is in every sense a specialized cement coating. Such a product cannot be produced by any effort to re-adapt a common oil paint but must be built up fundamentally from special materials which, due to their physical characteristics and chemical properties, are suited for the production of a strictly specialized product.

C—The third class of dampproofing treatment involves the application of bituminous products to the interior of exposed walls. The treatments in the first two classes as outlined above are applied to the exterior of the superstructure, while the special bituminous products are distinct in being applied to the inside of the wall.

These products are black in appearance and usually of quite heavy body, being applied with a brush so as to provide a thoroughly continuous coating. They are characterized by indefinitely remaining tacky, and provide bond for a coat of plaster applied directly to the coated surface. It is to be emphasized that the prime purpose in the application of such products to interior walls is for dampproofing results, and the fact that they have the associated property of bonding a coat of plaster is distinctly secondary.

It has become a very general practice in construction work to provide for the application of such a dampproofing on the interior of all exposed walls, as it gives an element in the wall that will prevent the continuous penetration of dampness or moisture through the wall, which would injure and destroy the interior decorations and produce a damp and unhealthy condition.

The subject of waterproofing proper, as we have defined applying to the treatment of sub-terra construc-

tion and structures intended for retaining and containing water under hydrostatic head, may very correctly be divided into the two characteristic methods, viz., integral and membrane, each of which has further sub-divisions.

The integral method of waterproofing involves the addition of compounds to the concrete at the time it is placed, and becomes a unit or integral part of the mass. This method is also known as the rigid method of treatment in distinction to the membrane which permits greater movement and conformation in the structure without injuring the effectiveness of the waterproofing treatment.

The integral method has been received with a great deal of favor by engineers, and its application has been increasing quite rapidly. Undoubtedly the more general selection and specification of the integral method in preference to the membrane in general sub-structural concrete work is due to the fact that the development in the design of reinforced concrete has served to enable the engineer to anticipate his tensile stresses and strain and provide against the rupture or cracking in the concrete by introduction of the proper area of steel. For all concrete construction work where proper reinforcing or provisions are made against cracking, the integral method is by far the most satisfactory, due to its greater general economy. Various compounds which are used for general integral waterproofing requirements may be divided into two classes characterized by the physical condition in which they are added to the concrete, viz.:

- (1) Finely powdered dry compounds which are mixed with the dry cement.
- (2) Compounds either in liquid or paste form which are added directly to the water used to temper the dry mixture of cement and aggregate.

The products coming under the first classification may be further divided, due to their characteristic physical properties, into three classes, viz.:

- (1)—Finely powdered compounds mixed with dry cement.
- (a) Repellent.
- (b) Non-repellent.
- (c) Metallic.

(a) The repellents were the first integral waterproofing compounds to be generally used. These materials are usually the metallic salts of various fatty acids that impart their characteristic repellent properties. The larger proportion of the repellent compounds are the lime salt of a fatty acid combined with a greater or lesser content of hydrated lime. Such lime soaps were undoubtedly originally chosen as waterproofing compounds due to their characteristic water-repellent properties. The repellent feature of such a compound is an excellent property to possess when the material is uniformly and homogeneously distributed in the mass of the concrete but its repellent nature makes even distribution quite difficult.

In the practical application of these dry repellent powders the material is mixed in proportions varying from 1 to 5 per cent with the dry cement. The treated cement is then combined with the aggregate and tempered with water to proper consistency. It develops in practical operations that regardless of the care that may be exercised in the careful and thorough dry mixing of the repellent powders with the dry cement, there is the characteristic tendency to be expelled from the careful mixture when water has been added. This, of course, is practically true when the concrete is mixed quite wet and there is greater opportunity for flow throughout the mass of concrete. In dry mixtures, such as are quite generally used in facing concrete blocks and artificial stone, the dry repellent powders can be used quite successfully, as the distribution can be maintained by holding the compound entrapped and imprisoned throughout the mass, with no opportunity to manifest its repellent properties, due to the dryness of the mixture. For general concrete operations, however, the repellent properties are greatly limited, due to their repellent action. The presence of quite a large percentage of hydrated lime is essential to serve as a ballast for the repellent material.

(b) The objection which has been taken by the engineering fraternity to the use of repellent products on account of the uncertainty in uniform results, has been a natural incentive to develop products which do not show this repellent action. These products are usually constituted on a basis of hydrated clay, aluminum hydroxide or some similar inorganic colloidal substance. In manufacture they are ground extremely fine so as to develop the largest possible surface area to intensify colloidal development. The partial efficiency of such materials is contributed by their void-filling value. They are also recommended as beneficial in lubricating the mass of concrete so that it flows together in a tighter and closer mass.

The limitation of such materials is due primarily to the fact that the products which are used, while of a characteristic colloidal nature, have not the capacity for sufficient colloidal development to fill out all the voids and apertures of a concrete mass and give a density that is absolutely impermeable. There is also considerable doubt in regard to the permanency of the colloids, due to the fact that when given opportunity of drying out there is some difficulty and delay experienced in their reverting back to their original colloidal volume.

(c) To complete the classification of various integral waterproofings which are mixed with the dry cement, metallic compounds should be mentioned. These products consist primarily of very finely ground metallic iron, and in their integral application are mixed dry with the cement in a similar procedure to other dry integral products.

The theory of the action of such products is the increase in volume that occurs from the oxidation of the iron. When the process is complete, in place of the fine particles of iron, there is developed the

hydrated oxide, which occupies a volume much larger than is the case with the original iron particle. The great difficulty, however, in obtaining satisfactory results with the metallic powders when used in integral application is the fact that cement itself is strongly basic and the presence of the hydroxyl ions developed in the crystallization of the cement naturally inhibits corrosion and prevents the oxidation and development of the iron throughout the mass of concrete, which is essential for efficient results.

The second class of integral waterproofing compounds which are added directly to the water, either in liquid or paste form, has the great advantage of absolute certainty in even, uniform distribution throughout the concrete. These products are generally readily miscible with water, forming a colloidal suspension in the water, and as a result of thorough mixing of the water with the cementing materials, are correspondingly uniformly distributed throughout the entire mass. The compounds in this class may for the most complete consideration be divided into the three following classes:

- (2) Compounds in liquid or paste form added directly to water used to temper concrete.
- (a) Unsaturated colloids;
- (b) extended colloids;
- (c) concentrated colloids.

(a) Under this class are included practically all compounds which contain unsaturated fatty acids that require reaction with the constituents of the cement in order to form the final waterproofing compound. These products are usually mixed with the water used to temper the concrete in proportions varying from 1:25 to 1:50.

The great general objection to the use of unsaturated colloids is the uncertainty of the effect upon the tensile and compressive strength of the concrete. The one constituent in the cement that is most reactive with the fatty acids in these unsaturated compounds is the calcium hydroxide, which also plays a very important part in the normal setting and hardening of the cement. The utilization of a portion of the calcium hydroxide for reaction with the unsaturated compound to form a waterproofing colloid will proportionately detract from the strength which the calcium hydroxide is intended to contribute in the normal hardening of the cement.

(b) Products included under the classification of extended colloids are not usually characterized by any tendency to enter into reaction with the constituents of the cement, but contribute their efficiency by the characteristic colloidal nature of the compounds themselves. The limitation of the extended colloids is in the fact that in the process employed in the manufacture of the products, there is invariably associated with the extended colloidal compound more or less inert material which is not particularly beneficial in contributing waterproofing value. The presence of varying percentages of inert and inactive materials associated with the colloidal compounds naturally makes these compounds uneconomical, as they must necessarily be used in quite rich proportion in order to carry in sufficient of the colloidal substance to give satisfactory waterproofing results.

(c) The products included in this class are a further development of the extended colloids in that they contain only materials of a strictly colloidal nature, which are capable of contributing waterproofing value. In their manufacture the inert and inactive materials have been eliminated, so that the final product contains only colloidal substances and so combined as to develop the maximum colloidal value. The fact that such products are concentrated affords the maximum economy, as they can be used in leaner proportions and still provide the colloidal volume that is essential to fill out all the pores and apertures in the concrete and give the density necessary for impermeability.

B—The second general division of the literal subject of waterproofing differs distinctly from the integral method in that it does not attempt to treat the concrete, but rather to insulate it from contact with water by enveloping the structure in a continuous bituminous shield. The fact that the membrane is not a rigid or unit part of the structure permits a certain freedom of movement and action in the concrete without impairing the efficiency of the waterproofing treatment. This feature of the membrane system makes it suitable for waterproofing work not fully reinforced and liable to settlement or subject to vibration or shock, such as a railroad bridge.

It was early practice to simply coat the surface to be waterproofed with hot tar or asphalt, but it soon became evident that this was not sufficient as the coating would crack with any movement in the wall. It was therefore necessary to employ some material in addition to the bitumen in order to contribute the necessary toughness and tensile strength. Burlap and coal tar felt have been extensively used for this purpose and some very satisfactory waterproofing operations have been carried out with such materials. During the last few years considerably more attention has been given to the nature of the waterproofing felt and as a result there are now on the market especially manufactured felts which are both saturated and coated with bitumen and possess greater pliability and strength. By means of these felts more perfect membranes can be constructed as the strength and toughness of the felt permit greater distortion and twisting to accommodate it to the design of the work.

The bitumens most generally used for cementing the felt together in constructing the membrane are coal tar pitch, commercial asphalt and special asphaltic compositions. While the general method in the application of the reinforcing felt and fabric with the bitumens is practically the same with all of the materials, there is considerable discussion in the engineering fraternity at the present time regarding the bitumens that are the most satisfactory.

A New Screen Achievement.

The largest inclined vibrating screen ever made on a commercial scale has just been perfected by the Sturtevant Mill Co., of Boston, Mass., and a short description of same is particularly interesting at this time.

The new giant screen has an actual screening surface of 144 square feet, consisting of a scalper or protective screen having forty-eight square feet and a fine vibrating screen containing ninety-six square feet of active surface. It is just twice as large as the biggest Newaygo Separator heretofore built, and has more than double its capacity.

There are many unique features which will appeal to screen users in general, and, to give a clear idea of the problems to be overcome with large screening units, it may be of interest to mention some of them.

Screen users all know that a great proportion of the screening (seventy to eighty per cent) is accomplished with every screen in the first few feet of its screen surface, for the reason that the finest dust passes the comparatively coarse meshes as soon as it reaches the screen cloth. As these fines are removed the task of screening becomes more and more difficult because the remaining material

vibration all over the cloth is absolutely necessary for good results, and to prevent the meshes from clogging. The only method yet devised to get proper and continual vibration is by stretching the wire cloth tight and automatically holding it tight like a piano wire. This cannot be done satisfactorily with large clumsy frames.

Accessibility is an important factor for convenience and quick repairs, for nothing is so necessary or more appreciated by the superintendent in charge.

Roughly, these are a few of the more important problems which confront the screen manufacturer and which have been overcome by Sturtevant engineers.

The have in these, Style "HH" Newaygo Separators, so arranged the screen length that the lower part balances in capacity the upper portion of the screening surface.

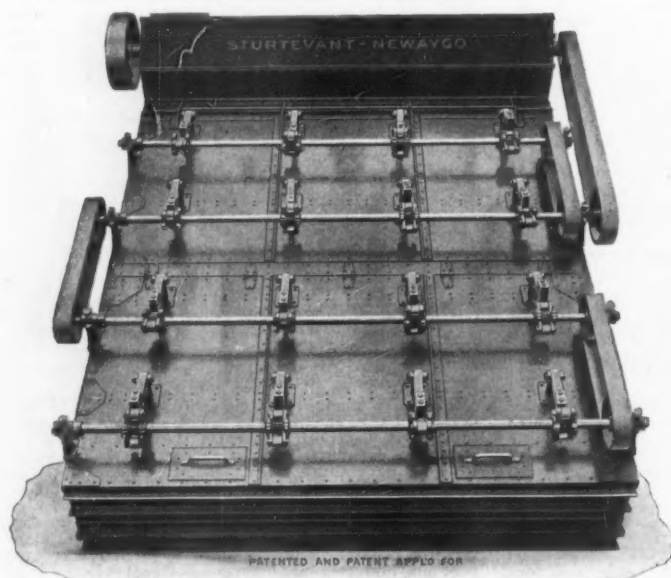
The screen is not too wide to prevent perfect distribution by conveyor feed with adjustable feed-board.

To prevent "racing" a swinging baffle-plate and "step" construction is used so that the material is stopped half way down and started all over again on the lower section.

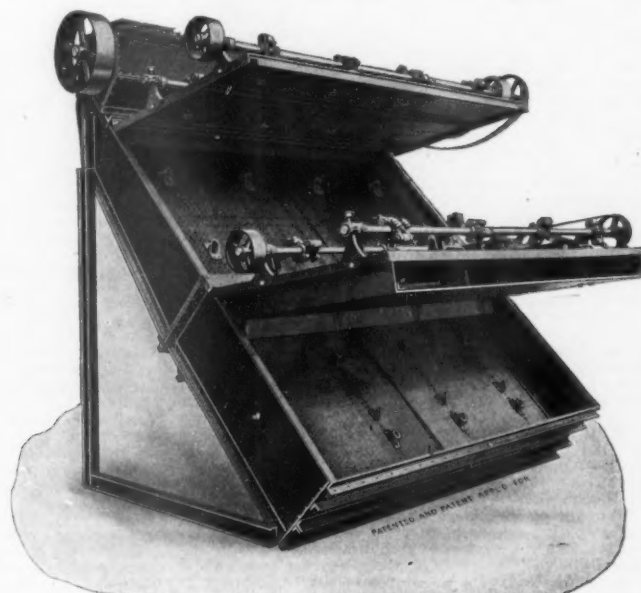
TRADE NOTES.

The E. I. du Pont de Nemours & Co. of Wilmington, Del., have just had printed a "Clay Blasting" booklet. As it is the first booklet ever issued on this subject, it contains valuable and interesting information. Some of the phases covered are "Digging Clay," "Stripping," "Blasting Down Shale," "Digging Plastic Clays," "Mining Flint Clays," "Draining Clay Pits," as well as full information on the use of explosives.

The Lehigh Portland Cement Co. is calling the attention of retailers throughout the country to the fact that 1916 will be the biggest cement year the country has ever known. More cement will be used as a result of increased building activity. In conformance with its dealer policy, the company is educating the retailers to "cash in" on the advertising campaign now being conducted in leading farm papers of the country. Specially written advertisements, lantern slides, electrotypes, calendar folders and other advertising literature is being supplied the dealer for local use. In this manner the retailer supplements the national advertising of the Lehigh company and is better enabled to profit by the publicity thus given "The National Cement," as advertised in these journals.



GIANT NEWAYGO SEPARATOR IN OPERATION.



STYLE "HH" NEWAYGO SEPARATOR SHOWING ACCESSIBILITY.

is nearer the size of the holes through which it must pass and can only go through when it hits the openings fairly. Therefore, a wide, short screen apparently does a great amount of work, and it does, but a screen user cannot afford to have 20 to 30 per cent of fines in the tailings, and, therefore, the length of any screening device must be carefully proportioned so that at least 95 per cent of all the material fed to the separator which is fine enough to pass through its meshes will do so and the tailings be free of such fines. Length alone will not do this, for when the dust is removed the remaining portion is in the form of sand, which has a strong tendency to race down the screen cloth, bouncing over and skipping a large portion of it, thus reducing the chances of passing through. This also causes a sand blast action which soon cuts out the screen cloth, making the upkeep excessive. The width of a separator is further limited on account of the difficulty of even distribution of the feed. This is essential in order that every inch of screen cloth may be working all of the time, and thus be efficient.

The size of screen frames is restricted to that which can be easily handled, otherwise when changing frames torn cloth will result and the cost of the operation will be exorbitant. Again efficient

The screen frames are divided so that no section is larger than 4 feet by 6 feet, which is a convenient size to handle, and on which the wire cloth can be stretched and automatically held taut.

Two doors open on top to expose the entire screen surface, the scalper screen lifts with the cover, as also does the swing baffle plate. Two doors open at the back for feed adjustment and operation. Four hand-holes open in convenient places for inspection purposes at the side, also hand-holes are provided through the cover to test the tailings for fines. The accessibility feature leaves little to be desired, and a few minutes only are needed to change screen frames, or to get at and remove any part of the separator.

The simplification of large screening propositions making one machine do the work of many will be appreciated in the cement field, for no matter how big the grinding mill may be, one of these giant machines will do the work. Its approximate output on cement clinker or limestone screening to 20-mesh is fifteen to twenty tons per hour, to forty-mesh about ten to fifteen tons per hour may be expected.

The Bourne—the classified ad department of the material industry.

The April issue of "Leschen's Hercules," published by the A. Leschen & Sons' Rope Co., St. Louis, Mo., contains a brief description and an excellent panoramic view of the plant where the famous Leschen wire rope is produced. In addition, illustrated articles on "Mountain Logging in Tennessee," and "Wire Rope and the Sugar Industry," are interestingly presented.

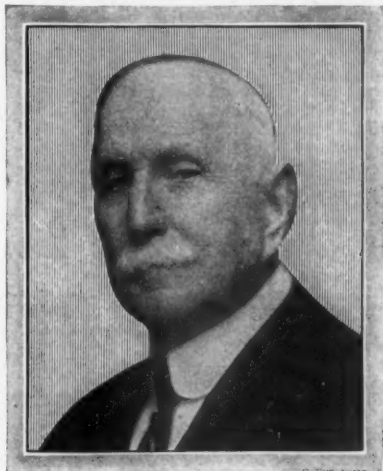
The Link-Belt traveling water-intake screens are illustrated and described in bulletin No. 229, which has just been published by the Link-Belt Co., whose works are located in Philadelphia, Chicago and Indianapolis. Arguments showing why these screens should be used in preference to stationary screens are convincing, as they are presented from the standpoints of economy, sanitation and service. Other bulletins recently issued by the company are No. 264, entitled "Shoveling Coal by Machinery," and No. 267, entitled "Moving Material Indian File." Both of these publications have been written by Henry J. Edsall, M. E., and are generously illustrated with pictures showing the various uses of Link-Belt conveying systems.

The Zeidler Concrete Pipe Co., Muscatine, Ia., has published specifications of its bell and sewer pipe, as well as an illustrated price list of its sewer and culvert pipes.

Raymond Bros.' Impact Pulverizer Co., 1315-1325 North Branch St., Chicago, has just issued catalog number 12, which graphically describes and illustrates the company's grinding, pulverizing and air separating machinery. In the introductory notes, the company refers to the addition of a smaller size pulverizer and the fact that the past few years have brought about valuable improvements in its line of machinery. For over forty years the firm has manufactured grinding, pulverizing and air separating machinery suitable for every material that is to be reduced to powder form. The universal practice in fine pulverizing and separating two decades ago was absolutely primitive in basic principle, according to the company, burr stones and bolting cloth being assumed the most desirable means for grinding and separating at that time. Grinding rooms were dust-laden infernos. Inefficient and crude machines were a constant expense to mill owners and dust-polluted air was a constant injury to the health of the employees. The Raymond system was based on new principles and has proven an important factor in the development of modern pulverizing and separating machinery. Raymond machinery is installed today in a large number of cement, lime, limestone and gypsum plants of the country, some of the installations being shown in the book, together with illustrations of the Raymond roller mills and air separation plants. The catalog should be in the library of every crushing and pulverizing plant in the country.

LEVALLEY RESIGNS AS HEAD OF CHAIN BELT CO.

C. W. Levalley has recently retired as president of the Chain Belt Co., of Milwaukee, Wis., and has been made chairman of the board of directors. Mr. Levalley founded the Chain Belt Co. and has been its president and general manager since 1891. He started the company in a small room making "Detachable Chain Belt" for farm imple-



C. W. LEVALLEY.

ments. Later the company branched out into making special chains, riveted roller types and gradually got into the elevating and conveying machinery business, transmission machinery and, nine years ago, broke into the concrete mixer field.

W. C. Frye, the newly elected president of Chain Belt Co., started with this firm when about seventeen or eighteen years old and has been with the company for about twenty years. He is also treasurer of the Sivyer Steel Casting Co., of Milwaukee; vice-president of the Federal Malleable Co., also of Milwaukee, and is a director of the new Electric Steel Casting Co., of Chicago.

The officers of the company at this time are as follows: president and treasurer, W. C. Frye; first vice-president and secretary, W. C. Sargent; second vice-president and superintendent, Donald Fraser; third vice-president, F. L. Sivyer; directors, C. R. Messinger, E. L. Wood, and the officers.

STATEMENT OF OWNERSHIP OF ROCK PRODUCTS AND BUILDING MATERIALS.

(Required by act of Congress, Aug. 24, 1912.)
Rock Products and Building Materials is published semi-monthly at Chicago, Ill.
Editors, E. H. Defebaugh and F. K. Irvine, 537 South Dearborn street, Chicago, Ill.
Managing editor, F. K. Irvine, 537 South Dearborn street, Chicago, Ill.
Business manager, E. H. Defebaugh, 537 South Dearborn street, Chicago, Ill.
Publisher, The Francis Publishing Co., 537 South Dearborn street, Chicago, Ill.
Owners: E. H. Defebaugh, 537 South Dearborn street, Chicago, Ill.
F. K. Irvine, 537 South Dearborn street, Chicago, Ill.
G. A. Olsen, 537 South Dearborn street, Chicago, Ill.
Estate of W. A. McCall, 537 South Dearborn street, Chicago, Ill.
Mrs. Margaret McCall, 4505 North Artesian avenue, Chicago, Ill.
Known bondholders, mortgagees and other security holders, holding one per cent or more of total amount of bonds, mortgages, or other securities: None.

E. H. DEFEBAGH, President.

Sworn to and subscribed before me this twenty-seventh day of March, 1916.

JAMES S. PENNINGTON,
Notary Public.

My commission expires Oct. 24, 1916.

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EMPLOYMENT WANTED

WANTED—Position as cement salesman. Have had 15 years' experience in cement. New York State preferred. Address Box 111, care ROCK PRODUCTS AND BUILDING MATERIALS.

WANTED—Position as Superintendent of gravel pit. Several years' experience erecting, reconstructing and operating. Address Box 1110, care ROCK PRODUCTS AND BUILDING MATERIALS.

Position as superintendent of artificial stone plant. I have taken charge of the largest firms in the U. S. Know the business from A to Z and can produce any mixtures for building or interior polished work. N. Dubuc Jr., 1395 Papineau Ave., Montreal, Quebec, Canada.

First class steam shovel engineer desires position. Fifteen years' experience on both construction and quarry work with different makes of shovels. Am familiar with revolving shovels. Am employed at present. Good reasons for wanting a change. Address Box 1117, care ROCK PRODUCTS AND BUILDING MATERIALS.

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We have an opening for a machinery sales engineer. He must be thoroughly familiar with and be competent to submit to clients preliminary designs, advice and cost estimates on machinery and its erection for elevating and conveying material or merchandise of all kinds on docks and in warehouses and factories. He must also have a full knowledge of, and be familiar with, machinery for rock crushing and sand and gravel screening, cleaning and washing plants, handling material either dry or wet. Must also have a thorough knowledge of application of shafting, hangers, pulleys and gearing for the mechanical transmission of power. Applicants please state nature and time of their experience, and with whom: age, married or single, and salary desired. We do not do an agency business but have our offices, engineering department and manufacturing plant on the Pacific Coast. Address P. O. Box 3097, San Francisco, Cal.

WANTED—Quarry Foreman in a large limestone quarry connected with lime plant, in Pennsylvania. State experience and reference. Address Box 1116, care ROCK PRODUCTS AND BUILDING MATERIALS.

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Machinery Wanted—9x10, D. D. D. C. hoist engine, must be in good condition, state price and where it can be seen, in first letter. Peru Stone & Cement Co., East Peru, Iowa.

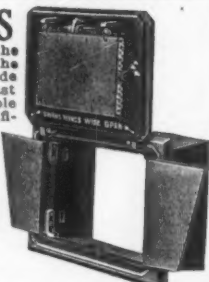
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One-yard orange-peel bucket. Good as new. Low price for quick sale. Schaefer Machine Works, 3500 Gray's Ferry Road, Philadelphia, Pa.

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FOR SALE—One Sullivan Air Compressor, 2 stage, straight line, 1,000 cu. ft. capacity, with receiver: good condition.
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FOR SALE—One-half ton plaster mixer in good condition, also two stove sand driers. A. R. RUTLEDGE, Penobscot Bldg., Detroit, Mich.

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CRUSHER FOR SALE—A No. 15 American Pulverizer (Ring & Hammer type), only used four months. Will sell cheap. Address Box 1102, care ROCK PRODUCTS AND BUILDING MATERIALS.

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With all necessary buildings, two crushers, lime grinding machine, (6) kilns capacity of 1,800 bushel per day. Plant in full operation, centrally located, fully equipped. Splendid crushed stone business. Two railroads by the plant, making shipping facilities the best. The property contains 37 acres of land underlaid with an inexhaustible supply of lime and building stone. A splendid opportunity to make big returns on the investment. Reason for selling, advanced age and ill health. Address Box 425, Frederick, Md.

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LIME MANUFACTURING PLANT, on trunk line midway between Jacksonville and Tampa, Florida. Best of freight rates. Substantial business already acquired in building, sanitary, fertilizer and paving stone lime. Address John M. Graham, Ocala, Fla.

FOR SALE—Plant of the Green Mountain Lime Company at New Haven, Vermont. Capacity, 300 barrels per day with present equipment which is inadequate to supply the demand for the Company's product. Great opportunity to add an Agricultural Lime Plant which will sell all the by-products at good profit. The Company has the largest chemical lime trade in New England.
GREEN MOUNTAIN LIME COMPANY, RECEIVERS,
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FOR SALE—A Sand Lime Brick Plant, capacity 30,000 per day, or would make liberal arrangements with a party to finance the enterprise. Chas. H. Hillman, Haddonfield, N. J.

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Limestone Quarries. Inexhaustible supply. No overburden. Highest analysis. Hydro-electric power. Best agricultural and health resort section of South. Famous mineral springs on property. Trunkline railroad publishes Special Commodity Inter-State Rate. Station on property. Will sell, develop jointly or exchange. "Limestone," Charleston, S. C.

BUSINESS OPPORTUNITY.

WANTED—Partner to join me in Hydrated Lime Plant. I have the property and most of the equipment. Porter Warner, Chattanooga, Tenn.

FOR RENT—Part of our yard, office, track and warehouse. Can furnish good delivery service, centrally located on the south side of Chicago. Ideal place for face brick, fire brick or fireproofing company. Address Box 1114, care ROCK PRODUCTS AND BUILDING MATERIALS.

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We make the "CLIPPER"—The drill that is USED!

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are pure and brilliant in tone, economical in application and a permanent guarantee against fading and washing

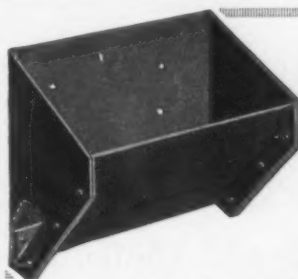
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They are the acknowledged best for all uses—Mortar, Brick, Cement, Concrete and stone. Red, Brown, Buff, Purple and Black.



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For Handling Broken Stone, Gravel, Sand, Clinker, Cement, Lime, Coal, Coke, Ores, etc., etc.

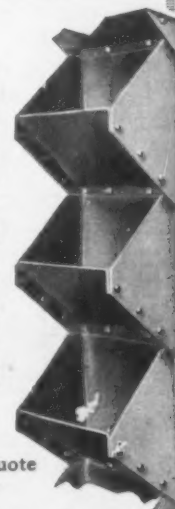
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ROCK PRODUCTS and BUILDING MATERIALS

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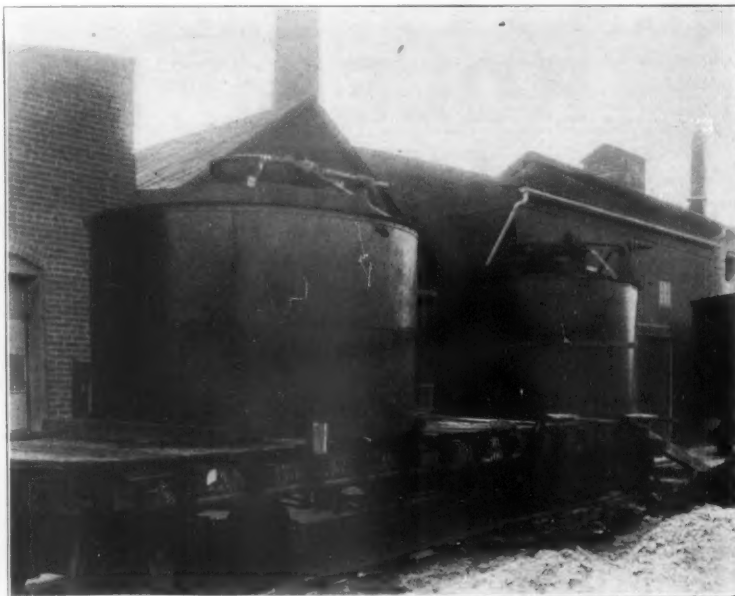
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Digesters installed at our Port Clinton, Ohio, plant.
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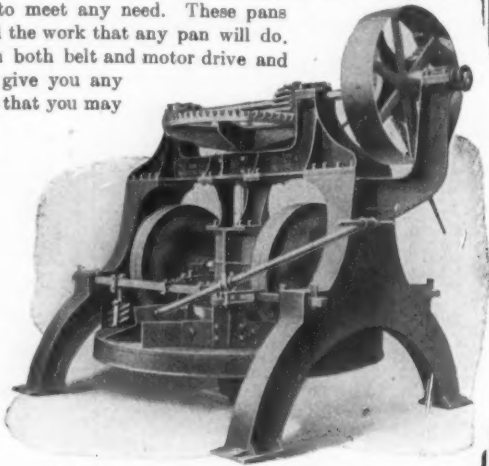
THIS pan is the identical pan required for your plant and it should speak to you convincingly of our pan quality. It has put many Sand-Lime Brick Plants on a paying basis and will make money for you. There is no line of pans made which will compare with the "Built Right, Run Right" line and your needs can be fully taken care of from our peerless line. We build pans with a range in size and capacity to meet any need. These pans are adapted for all the work that any pan will do. We have them in both belt and motor drive and will be pleased to give you any points on our pans that you may inquire about.

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*We Build Complete Equipments for
Sand-Lime and Clay Brick Plants*

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Concrete—Mortar—Plaster
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St. Paul Bldg., Cincinnati, Ohio

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COATING**



FOR SURFACES of Cement, Stucco, Brick, etc.

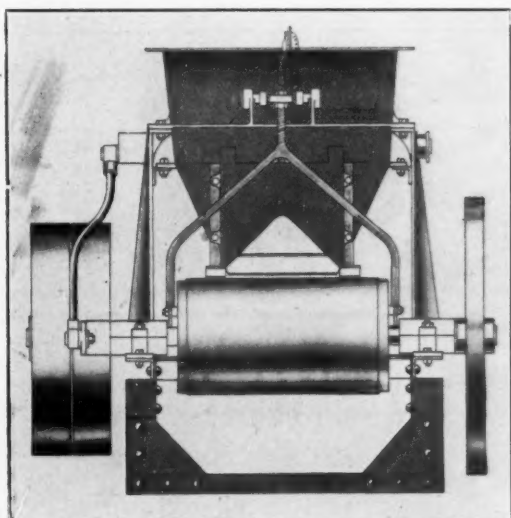
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This is a dealers' proposition. Write to-day for our interesting offer.

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To weigh and regulate the flow of material traveling in a continuous stream over a conveyor.

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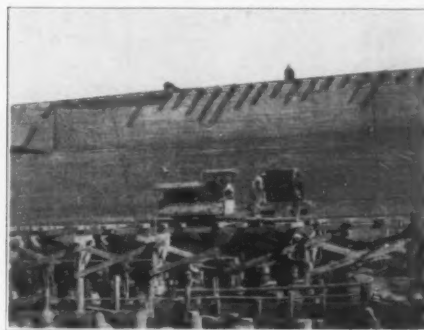
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From Photo

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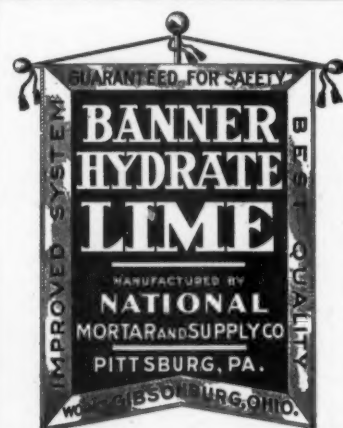
*Carries more sand for Mason Work,
than any other lime on the market*

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"Lion Brand
Rock
Wall Finish"
Hydrated Lime.

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Western
Lime Co.**
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Producers
of Ohio and
Indiana
Lime*



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When it comes to Finishing Hydrate order "MONARCH" and eliminate all chance of delay, trouble or worry. MONARCH Hydrated Lime is made from the purest of Limestone and only the latest improved machines are used in its manufacture. Every pound of it we guarantee.

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and information*

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MITCHELL HYDRATED LIME

helps to make a better concrete job. It makes the mix flow more readily into every corner of the forms. It makes a dense mass that doesn't leave pockets or voids. That's why it's the greatest waterproofing medium known.

Hydrated Lime insures a uniform mixture, because it makes a fat, adhesive mortar that adheres to each piece of the coarse aggregate, reducing segregation to a minimum. Hydrated Lime gives the mixture the plasticity to destroy the excess friction caused by the angular condition of the aggregate, forming a smooth-flowing, continuous stream of concrete that automatically falls into place, saving labor in tamping and spading.

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Hydrated Lime

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This church is plastered with a mixture of Tiger Brand White Rock Finish sand and hair.

Point out to the plasterer and others interested that they will secure a better building by plastering with

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This lime with sand and hair makes a scratch and brown coat which deadens sound, prevents echoes and otherwise improves the acoustical properties of any hall.

For the finish coat Tiger Brand White Rock Finish gives a smooth surface that will not pit, pop or blister.

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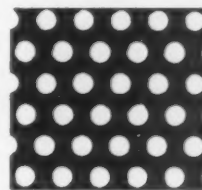
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Send for literature,
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Photograph Nov., 1915*

Because Glutrin Road Binder makes a road that is lowest in first cost, lowest in upkeep cost and high in durability and efficiency. GLUTRIN means a guaranteed success for macadam roads.

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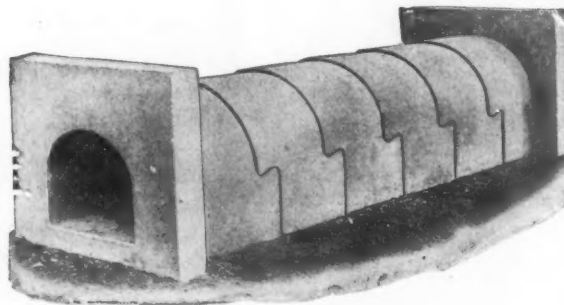
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Hartman Building



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The Hall Interlocking Concrete Culvert



The Culvert Everlasting

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Wherever used "Wolverine" has
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(the long keeper)	
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Fireproof Gypsum Partition Tile	

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Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

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you're giving good service; and
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It means "tested and guaranteed"

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for the

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Improved Equipment Co.
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Jeffrey Mfg. Co.
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Weller Mfg. Co.

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Fate Co., J. D.

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Sykes Metal Lath & Roofing Co.
Trussed Concrete Steel Co.

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Garford Motor Truck Co.
Pierce Arrow Motor Car Co.
White Company, The.

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Calvert Mortar Color Wks.
Chattanooga Paint Co.
Clinton Metallic Paint Co.
Gordon-Hitti Co.
Ricketson Mineral Paint Co.
Tru-Con Laboratories.
Williams, C. K., & Co.

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Johnson & Chapman.
Hendrick Mfg. Co.
Toepfer, W., & Sons Co.

PLASTER.

See Gypsum.

PLASTER BOARD.

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Du Pont de Nemours Co., E. I.

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Reynolds Asphalt Shingle Co.

PUMPS.

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International Steam Pump Co.

QUARRY CARS.

See Cars.

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Glutrin Paving Co.

ROAD MACHINERY.

Austin Mfg. Co.
Osgood Co., The.

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Atlas Car & Mfg. Co.

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Power & Mining Mach. Co.
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Natural Hydraulic

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In its specific field of usefulness—that of a cement for brick and stone masonry mortar, or as a concrete for mass work, such as building foundations, retaining walls, street and highway foundations, canal dams and locks, bridge piers and approaches and similar work, there is no American cement that can equal its record for service and durability.

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A big book, now on the press, entitled, "Utica On Trial," and soon ready for distribution, tells all about these canals, buildings, bridges and streets and shows actual photographs. It also gives engineers' tests and durability records and a copy is yours for the asking.

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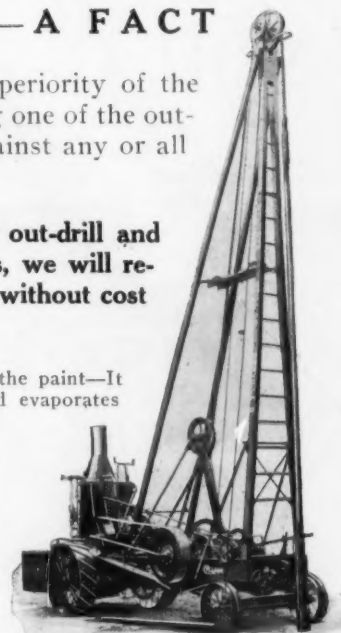
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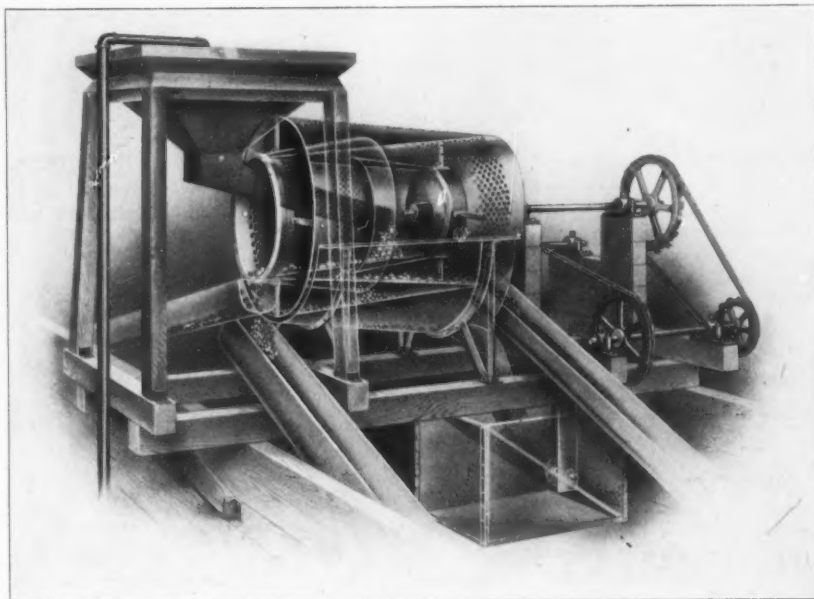
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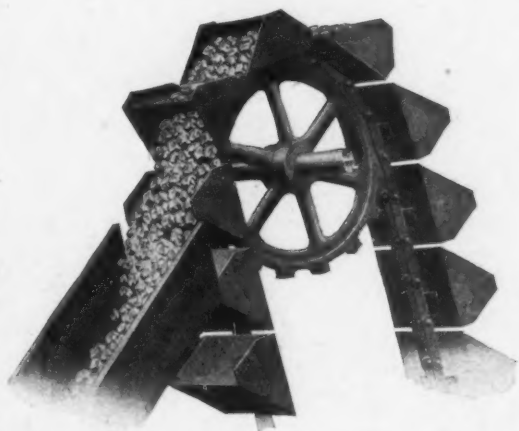
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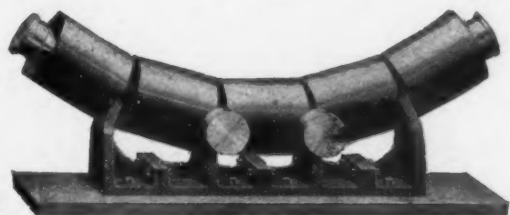
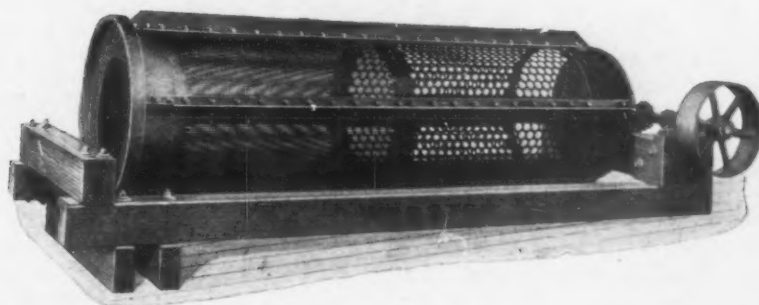


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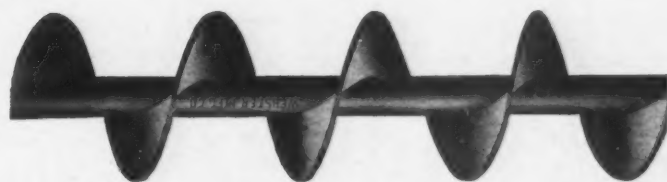


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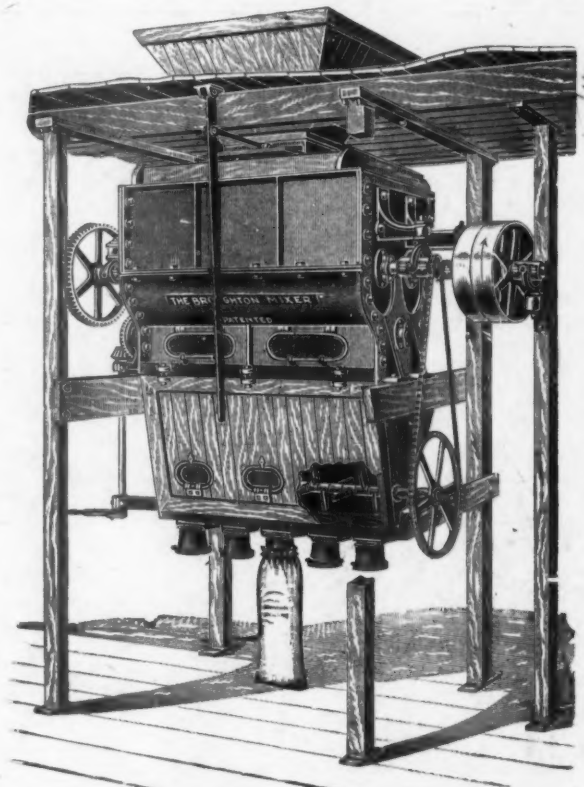


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